VOL XLI. No 2. FEBRUARY 1956

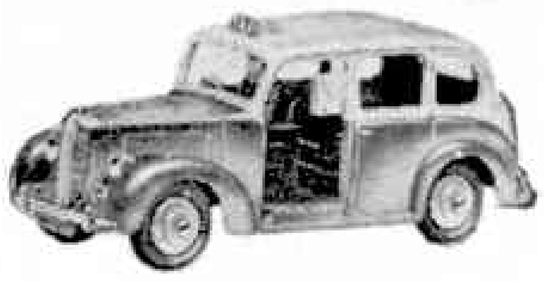
MECCANO MAGAZINE

MACHINING CYLINDER BORES OF DIESEL ENGINE

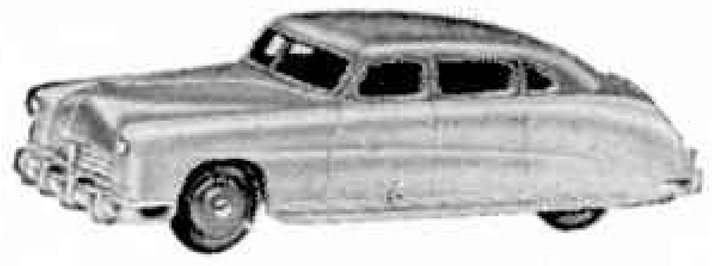
1/-

DINKY TOYS

TRADE MARK REGD.



No. 254
Austin Taxi
Length 3 11/16 in. **3/1**

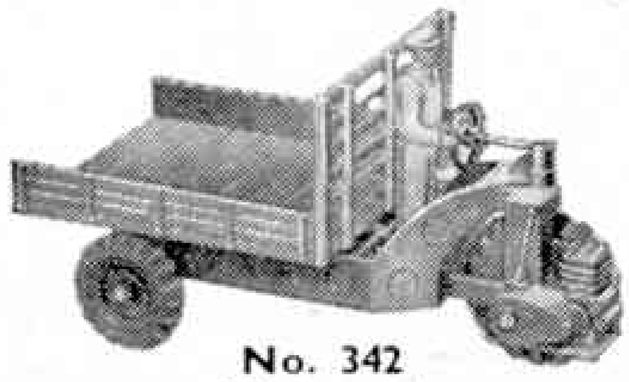


No. 171
Hudson Commodore Sedan
Length 4 3/8 in. **3/–**

No. 153
Standard Vanguard Saloon
Length 3 5/8 in. **2/6**

No. 107
Sunbeam Alpine Sports
Length 3 3/4 in. **3/6**

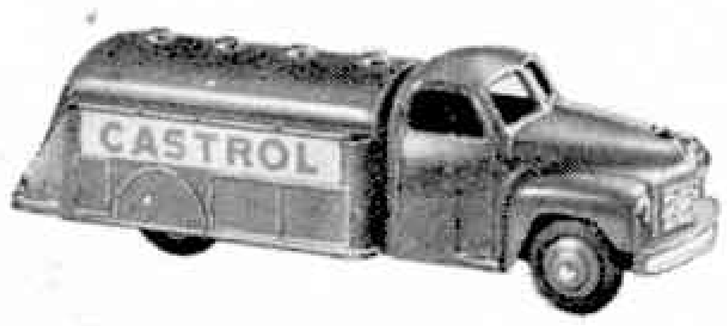
No. 734
Supermarine Swift Fighter
Wing Span 2 in. **1/9**



No. 342
Motocart
Length 4 3/8 in. **4/3**

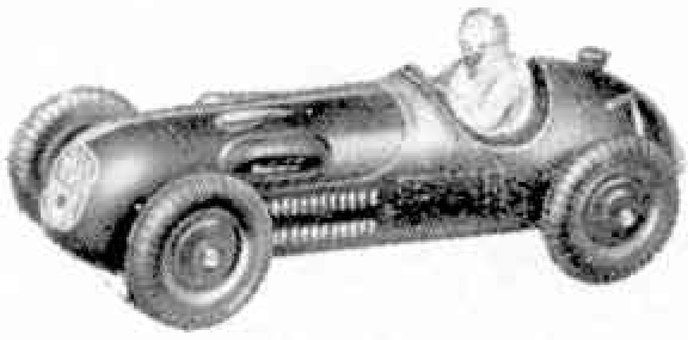
No. 692
5.5 Medium Gun
Length 5 1/8 in. **3/4**

No. 255
Mersey Tunnel Police Van
Length 2 7/8 in. **2/9**



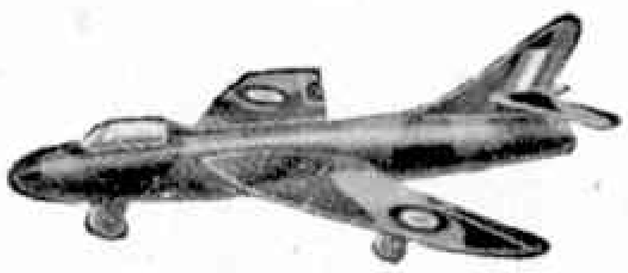
No. 441
Tanker "Castrol"
Length 4 3/8 in. **2/9**

No. 109
Austin-Healey 100 Sports Car
Length 3 3/8 in. **3/6**



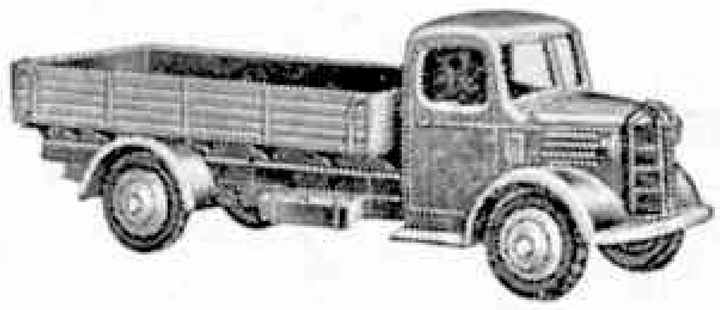
No. 235
H.W.M. Racing Car
Length 3 7/8 in. **2/6**

No. 301
Field Marshall Tractor
Length 3 in. **4/6**



No. 736
Hawker Hunter Fighter
Wing Span 2 1/8 in. **1/9**

No. 260
Royal Mail Van
Length 3 1/8 in. **3/–**



No. 412
Austin Wagon
Length 4 1/8 in. **2/9**

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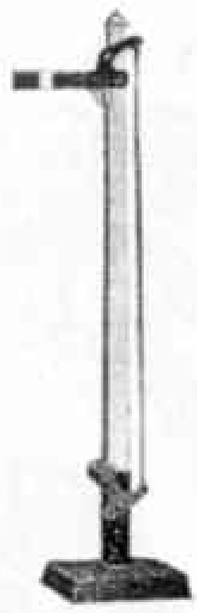
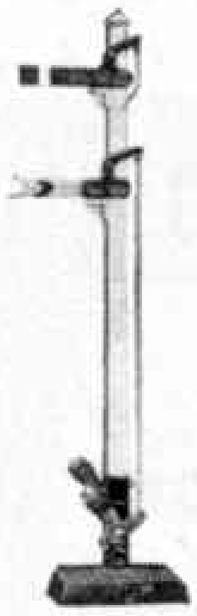
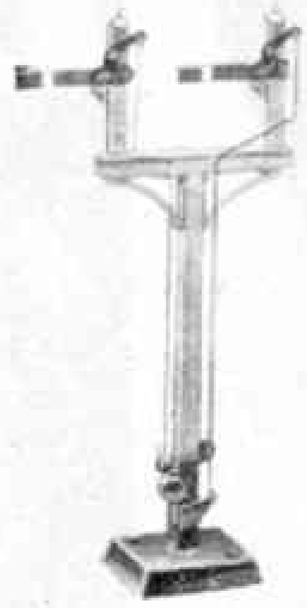


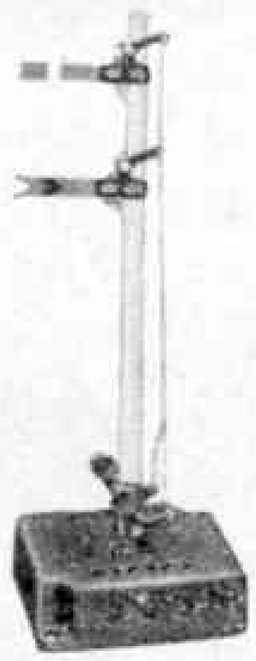
D1 Signal, Single Arm **2/6** ('home' or 'distant')



D2 Signal, Double Arm **3/–**

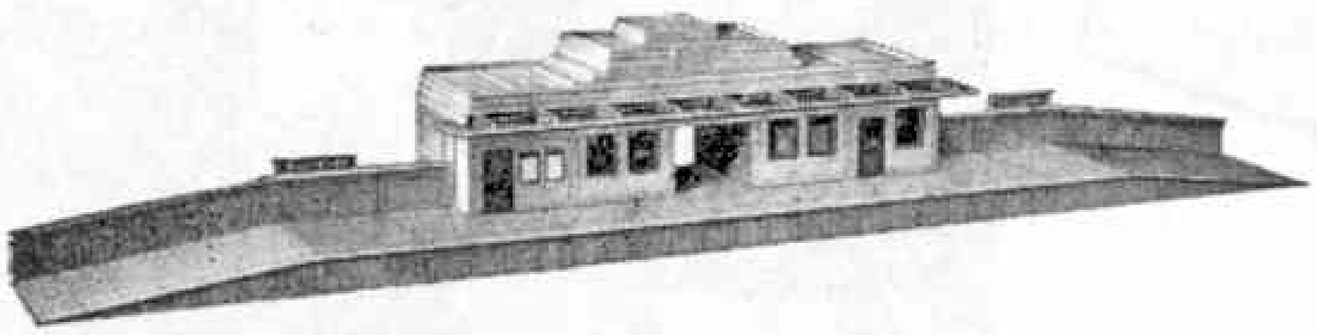


D3 Junction Signal ('home' or 'distant') **3/6**

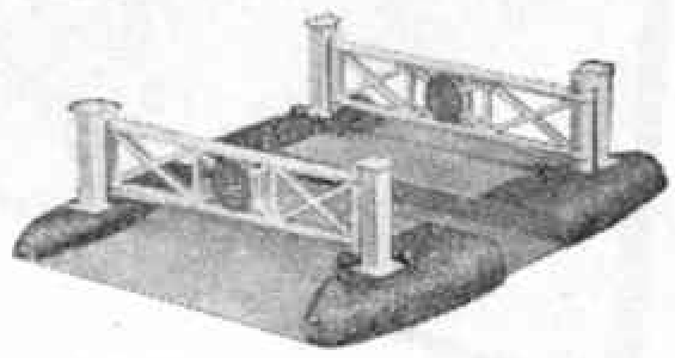


ED2 Signal, Double Arm, Electrically-operated **13/6**

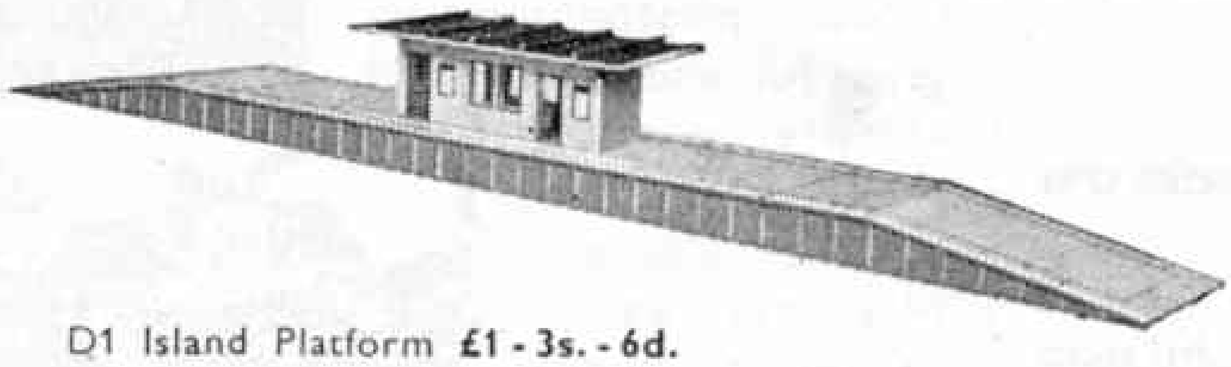
ED3 Junction Signal, Electrically-operated ('home' or 'distant') **14/–**



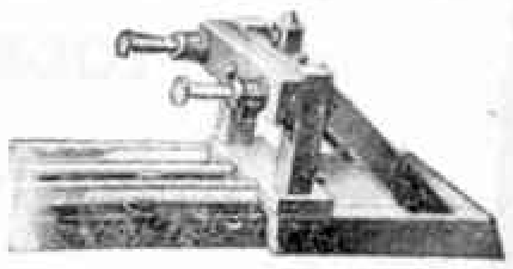
D1 Through Station **£2 - 5s. - 0d.**



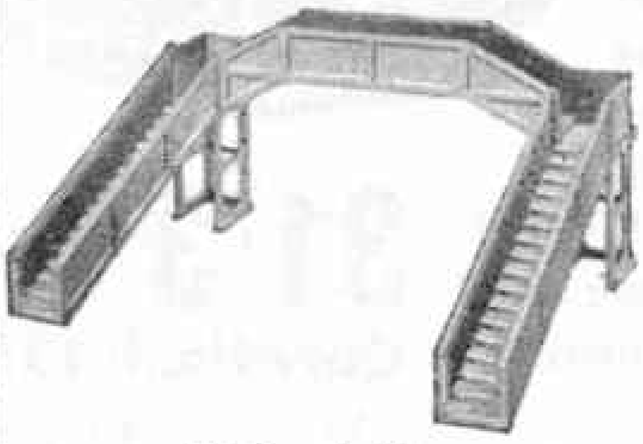
D1 Level Crossing **9/6**



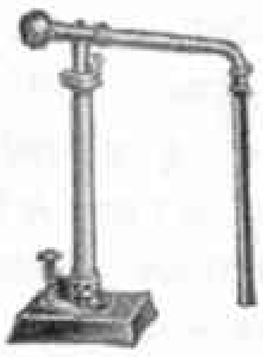
D1 Island Platform **£1 - 3s. - 6d.**



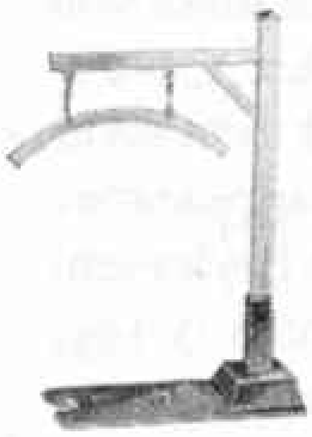
D1 Buffer Stop **2/1**



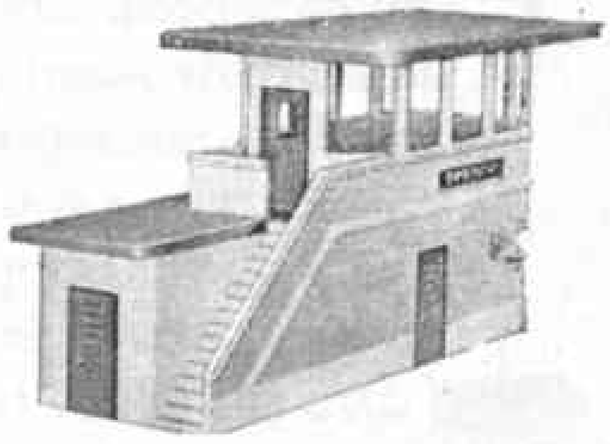
D1 Footbridge **10/3**



D1 Water Crane **1/9**



D1 Loading Gauge **2/6**



D1 Signal Cabin **13/9**

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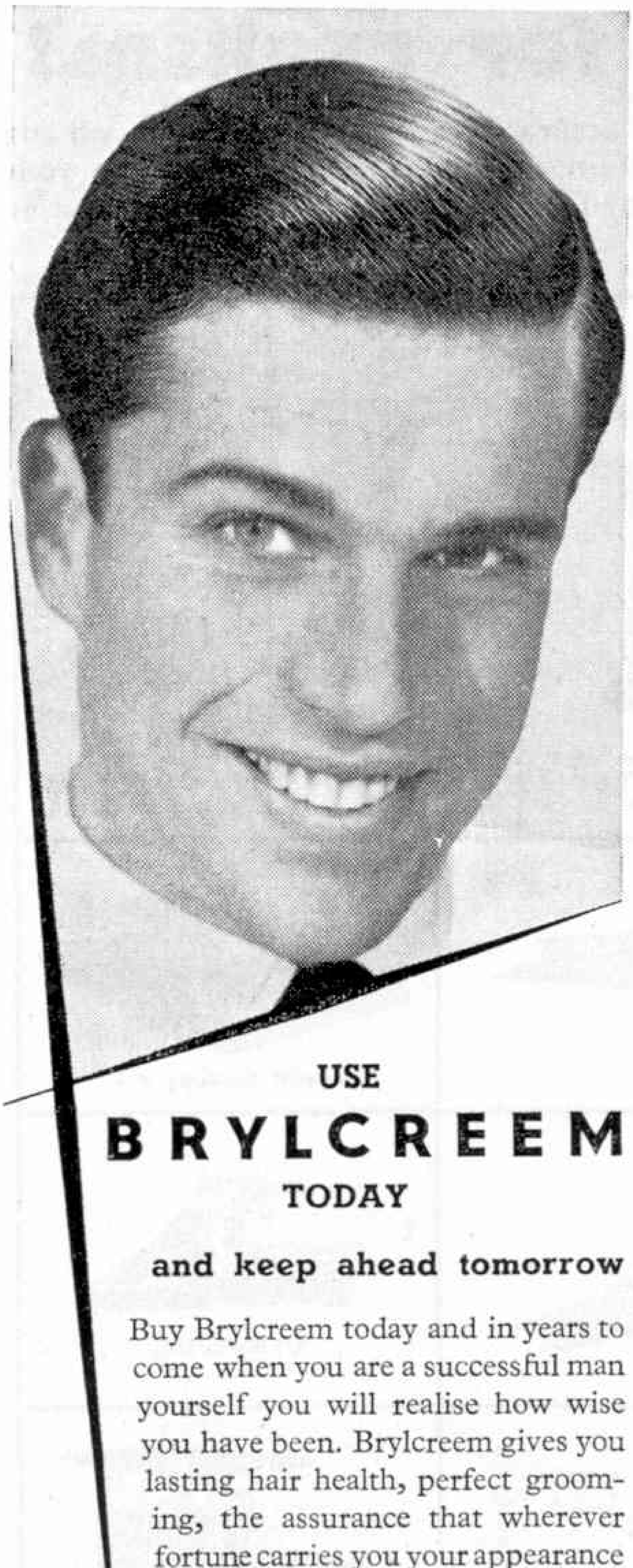

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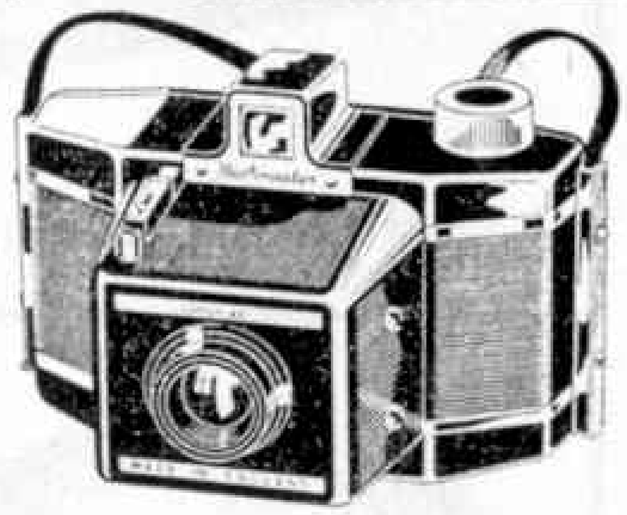

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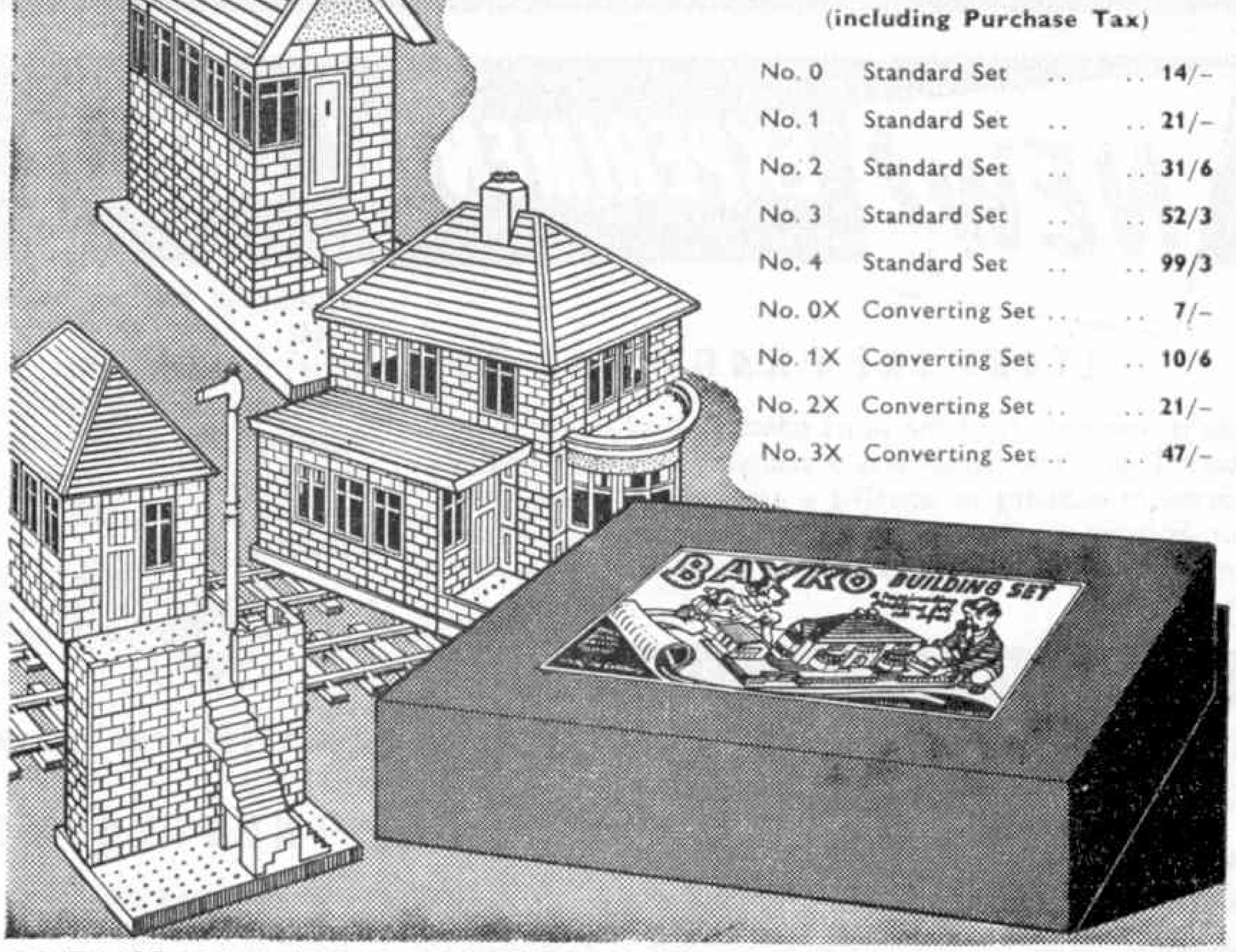

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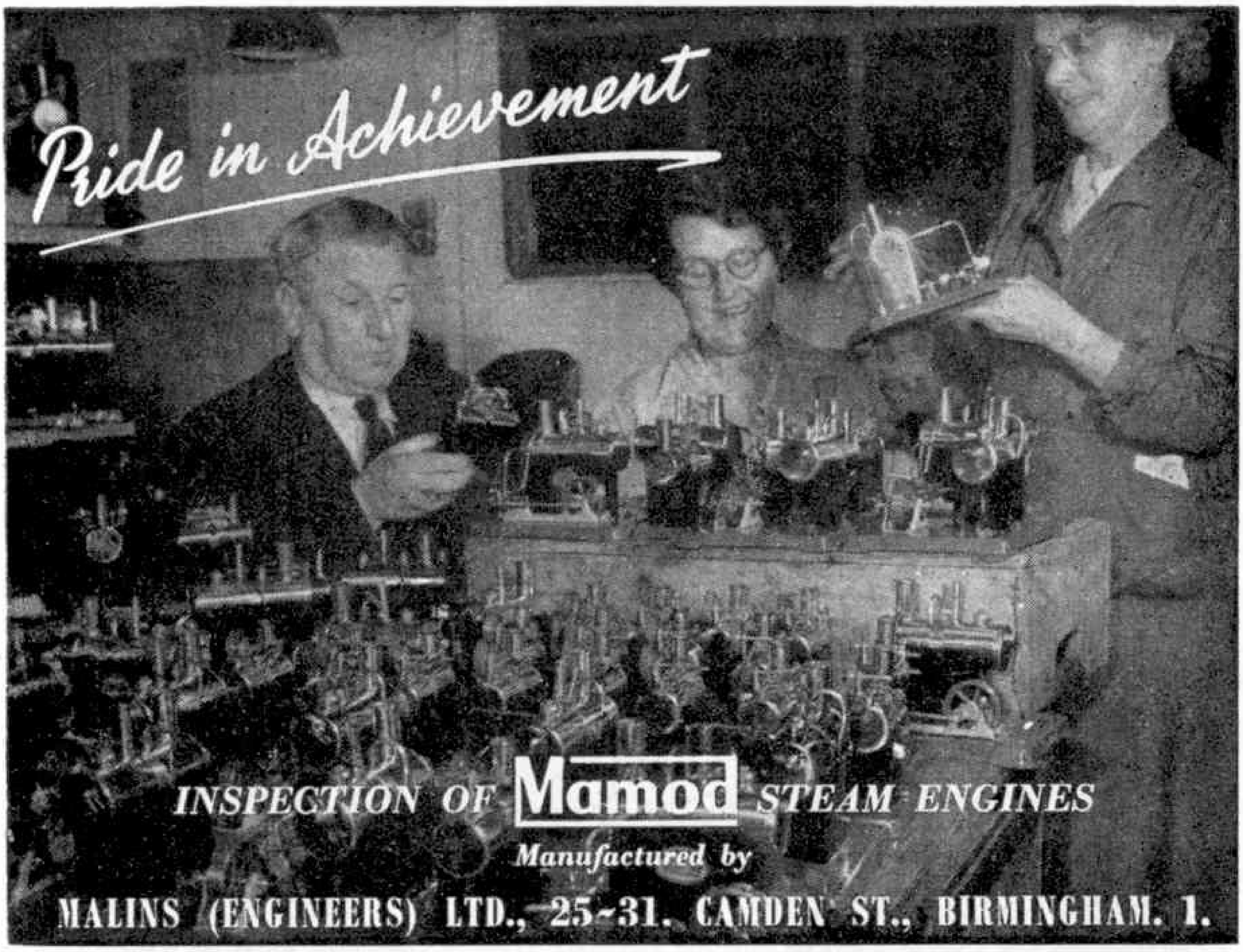
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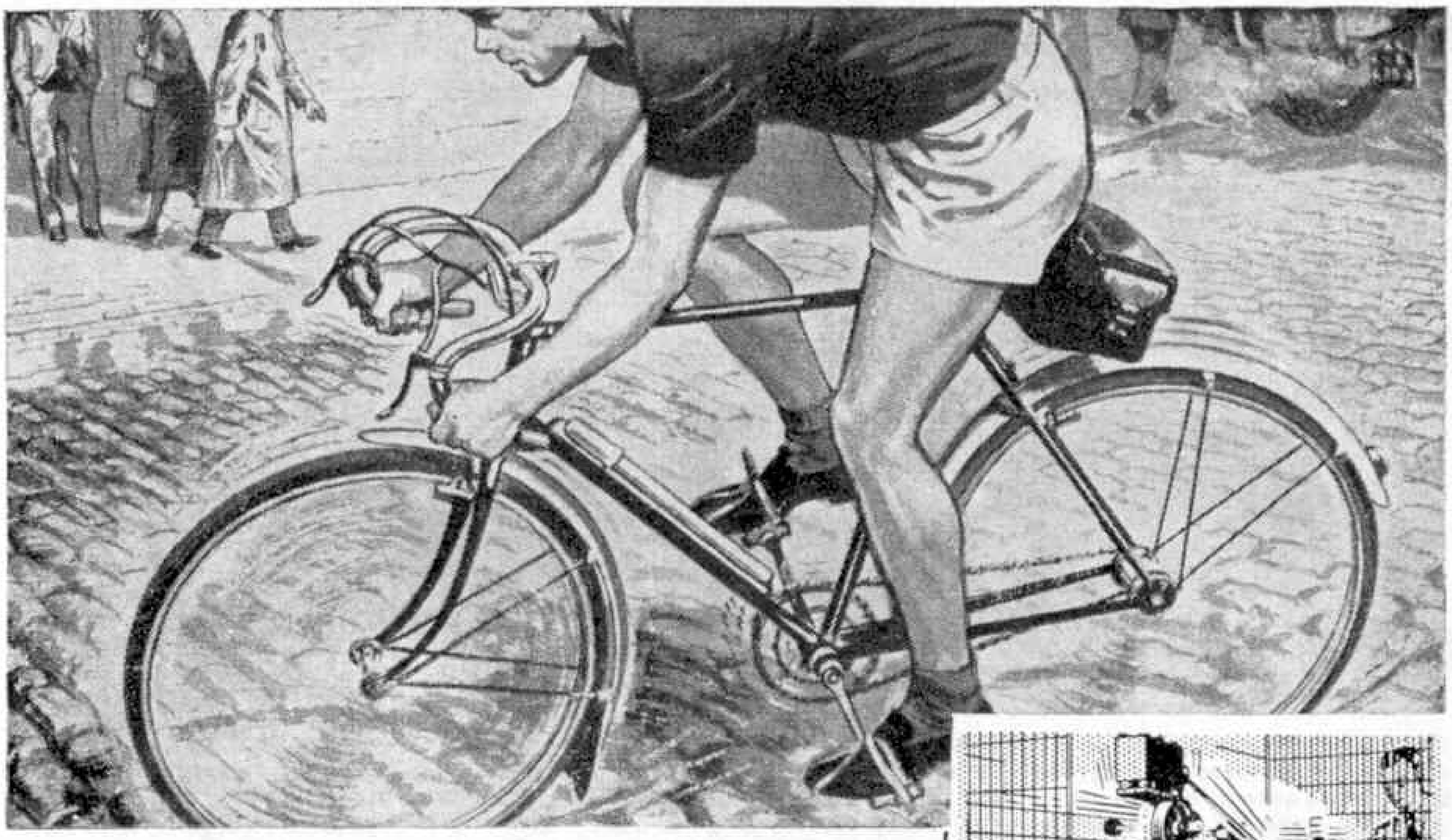

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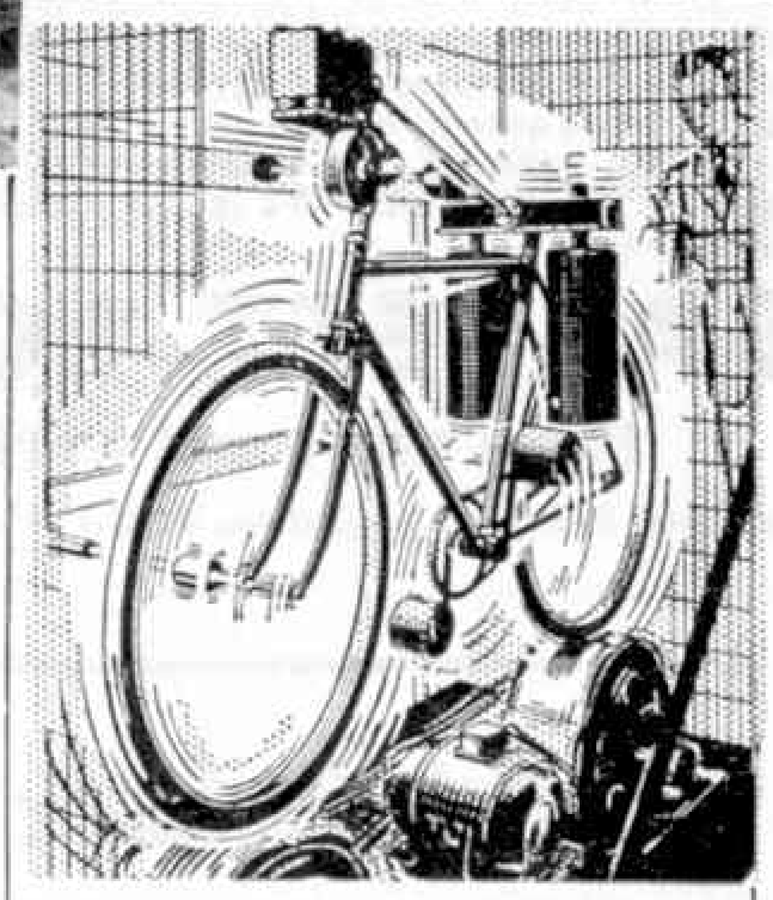

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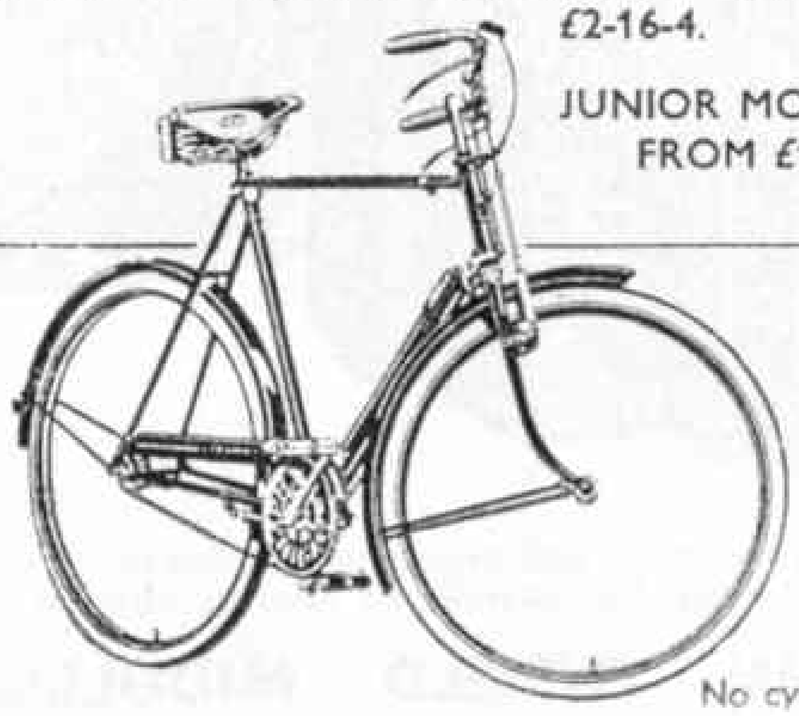

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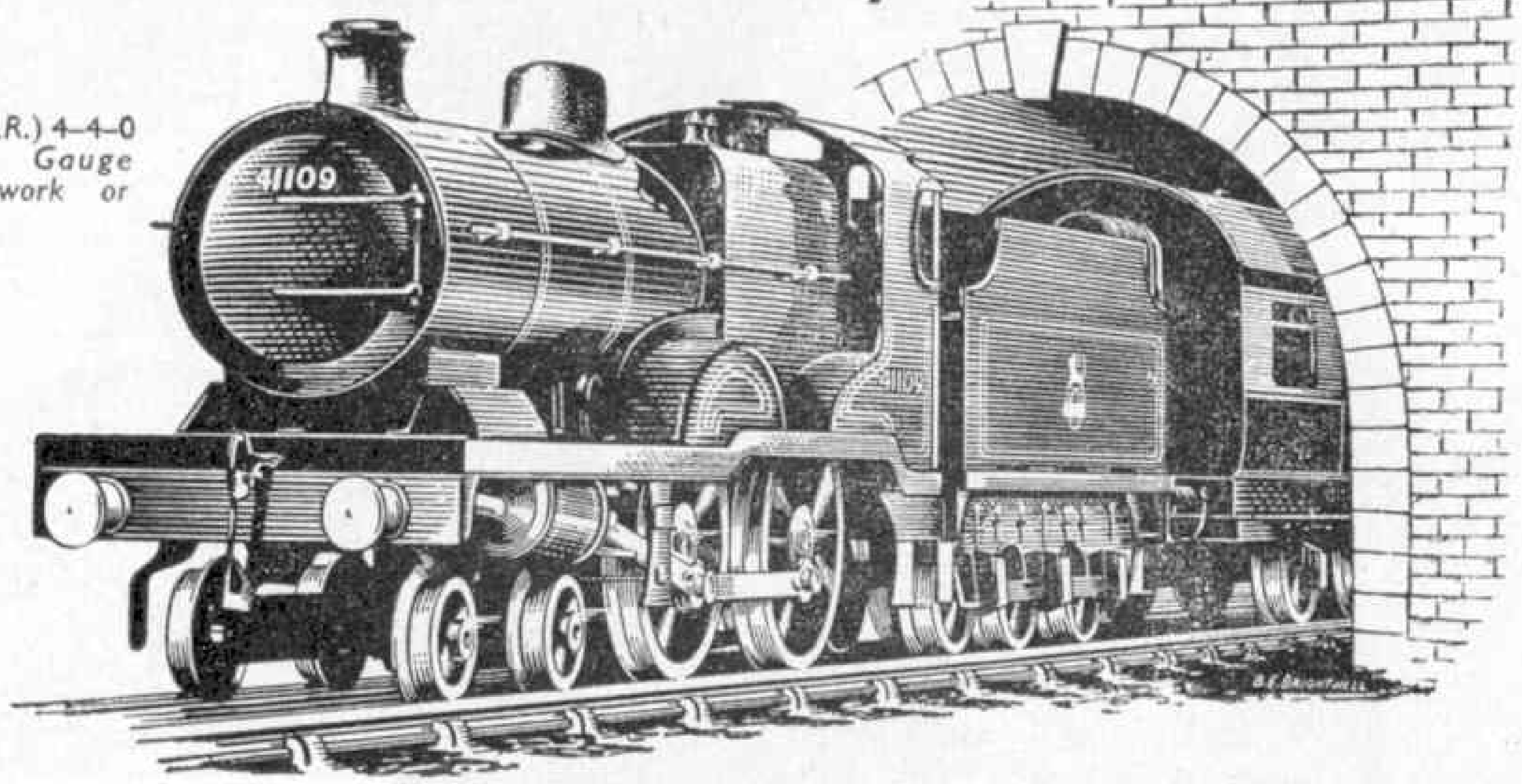

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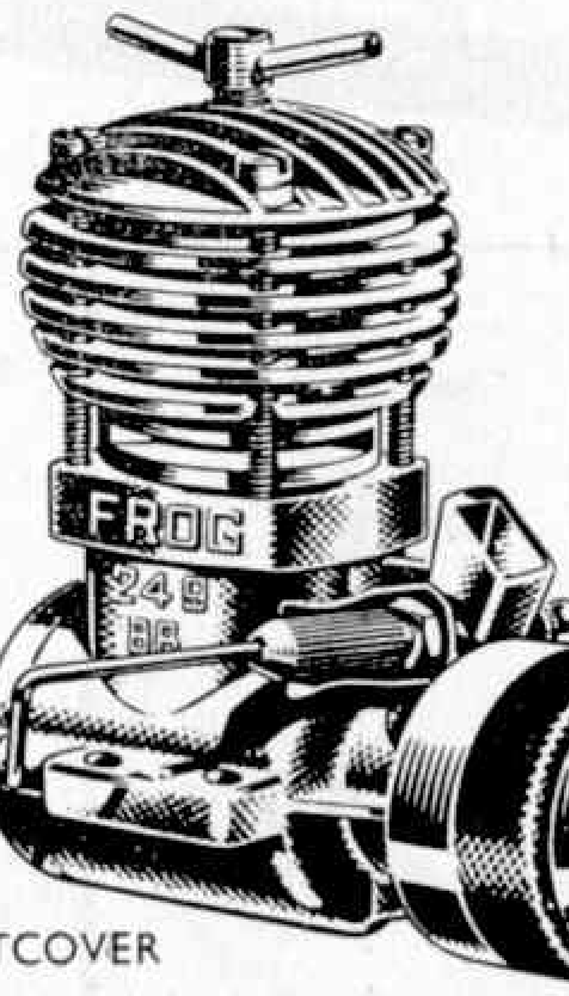

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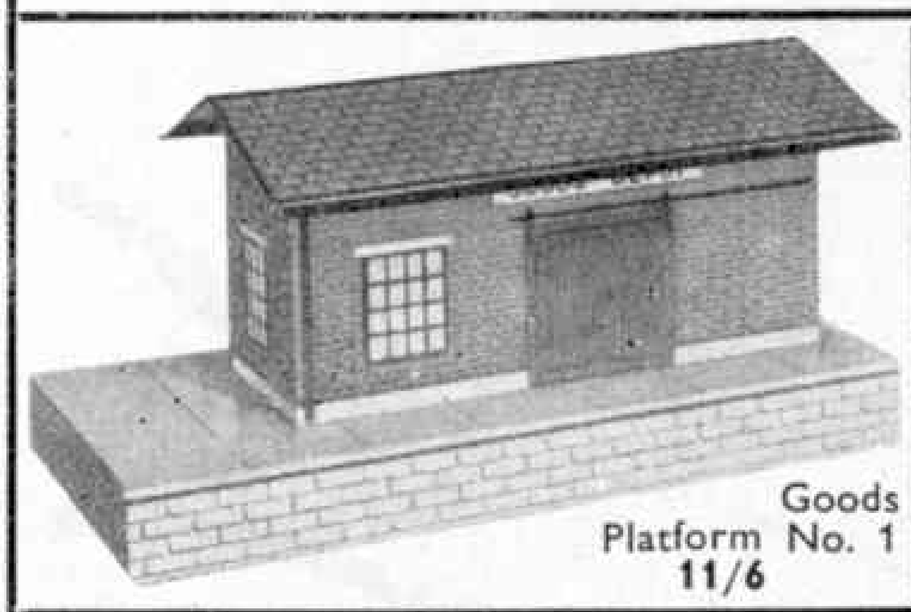
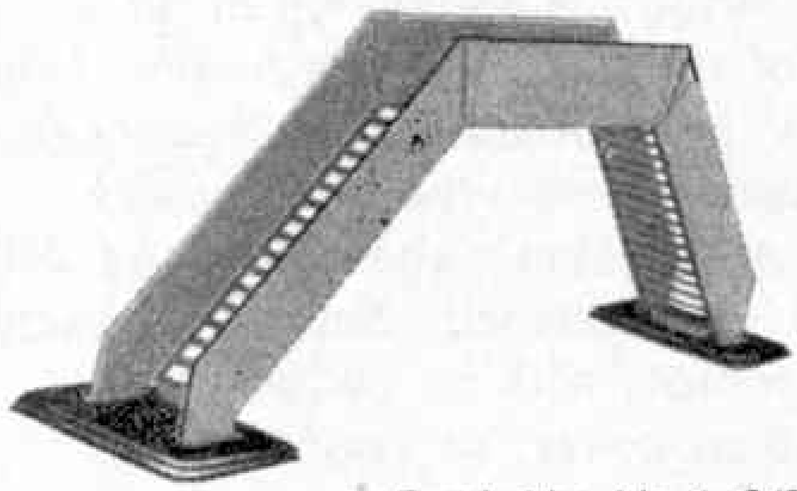


Goods Platform No. 1 **11/6**

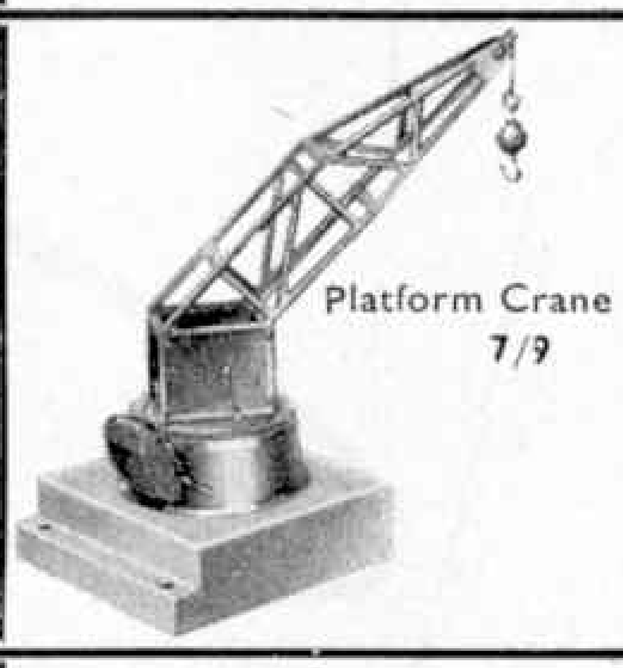
Station Hoarding **1/3**

Level Crossing No. 1 **8/9**

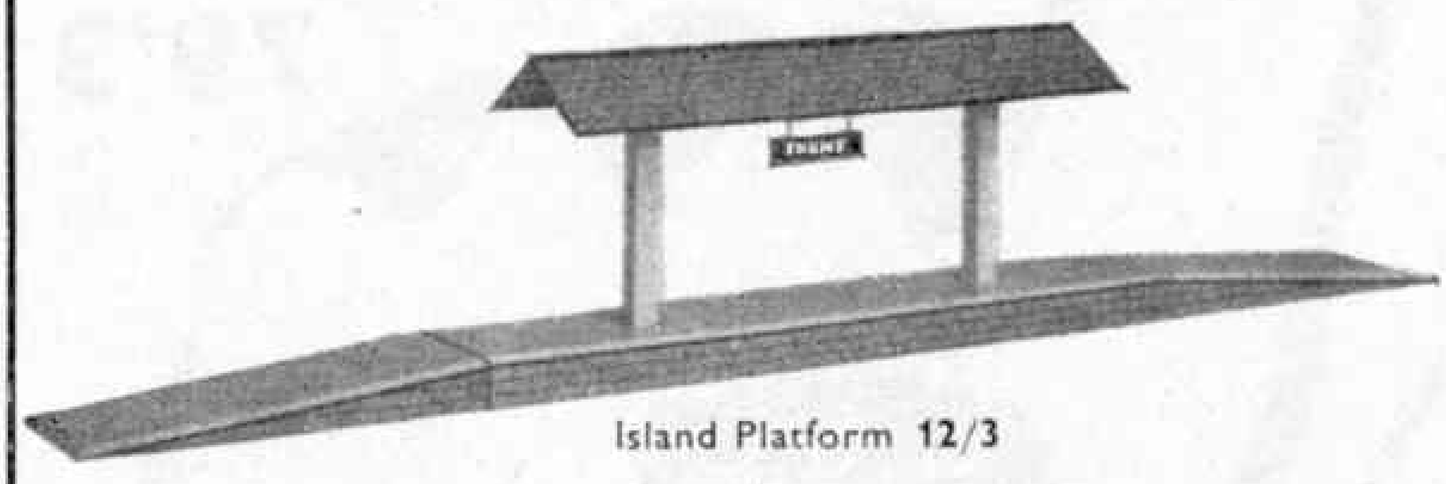


Footbridge No. 1 **8/9**

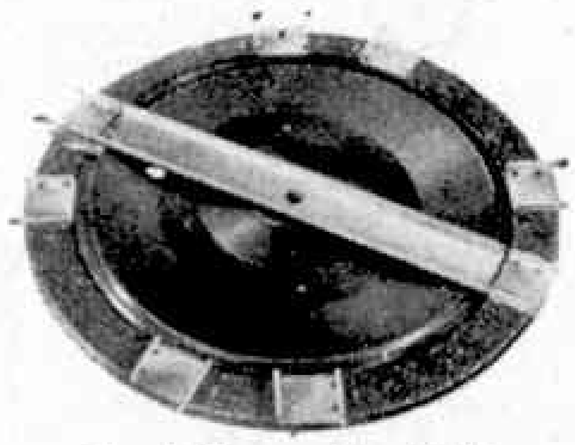
Signal Cabin No. 2 **6/9**



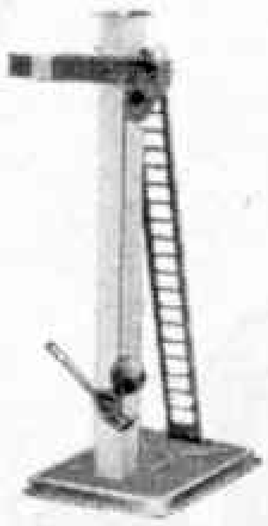
Platform Crane **7/9**



Island Platform **12/3**



No. 2 Turntable **10/9**



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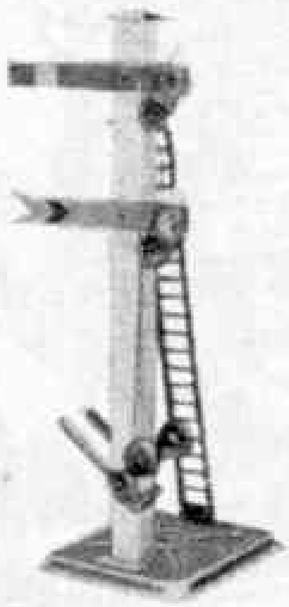

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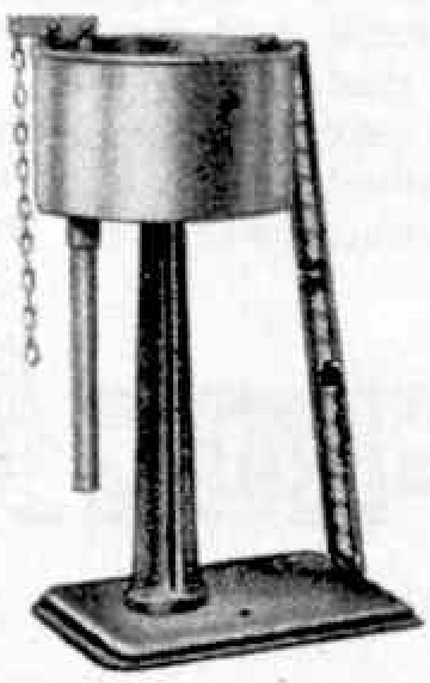

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MECCANO MAGAZINE

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EDITOR : FRANK RILEY, B.Sc.

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Can You Help?

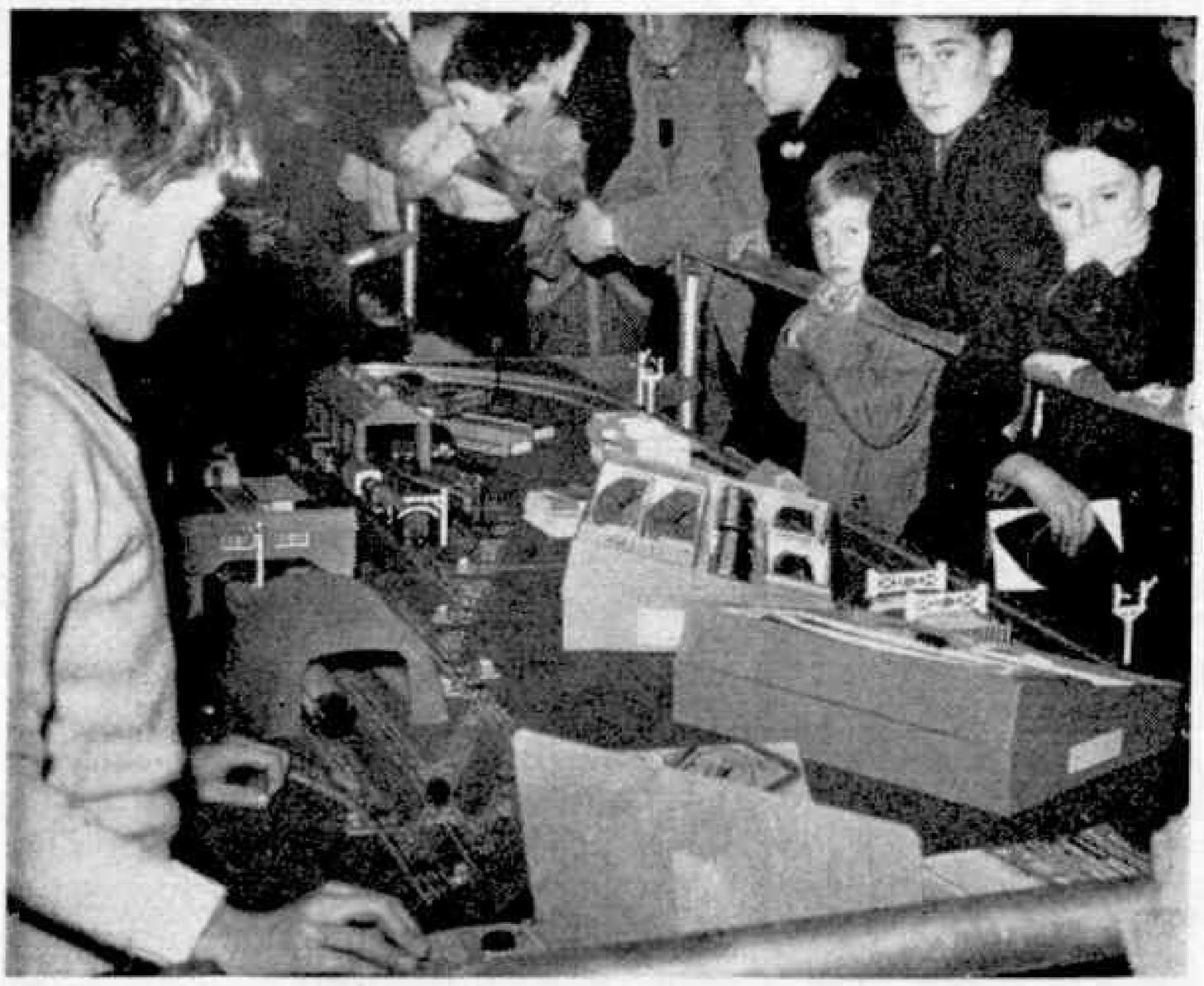
If I ever reach the age of 100 years, I shall almost certainly have my name, and perhaps my portrait, in some newspaper or other. To become a centenarian is a real distinction. It is surprising how many achieve this while remaining wonderfully active and appreciative, and we all wish them well.

Railways too celebrate their centenaries, and in their case we expect them to undertake the transport of people and goods as cheerfully and as vigorously as at any time during their history. A line that reaches its 100th year during 1956 is the London, Tilbury and Southend Railway, now part of the Eastern Region of British Railways.

This centenary is not passing unmarked. A celebration is being arranged that will probably take the form of an exhibition of rolling stock at Southend Central Station from Thursday, 1st March, to Saturday, 3rd March, with a display of small exhibits in the Odeon Cinema, which adjoins the Station.

The most spectacular centenary celebration however will be the running of a special train, made up of six or seven old L.T.S. coaches hauled perhaps by *Thundersley*, one of four 4–4–2 Tanks built in 1909 for the line. If *Thundersley* does haul the special centenary celebration train, it will not be the first time that she has taken part in celebrations, for in June 1911 she ran with special decorations to mark the Coronation of King George V.

Now some readers of the Magazine may be able to help to make this celebration noteworthy. The Eastern Region authorities wish to bring together as large and as interesting a collection as possible of relics, documents, models and so on of the former London, Tilbury and Southend Railway, and if you have any such relics, or know of some, you should write to Mr. M. B. Thomas, Public Relations and Publicity Officer, Eastern Region, Marylebone Station, London N.W.1.



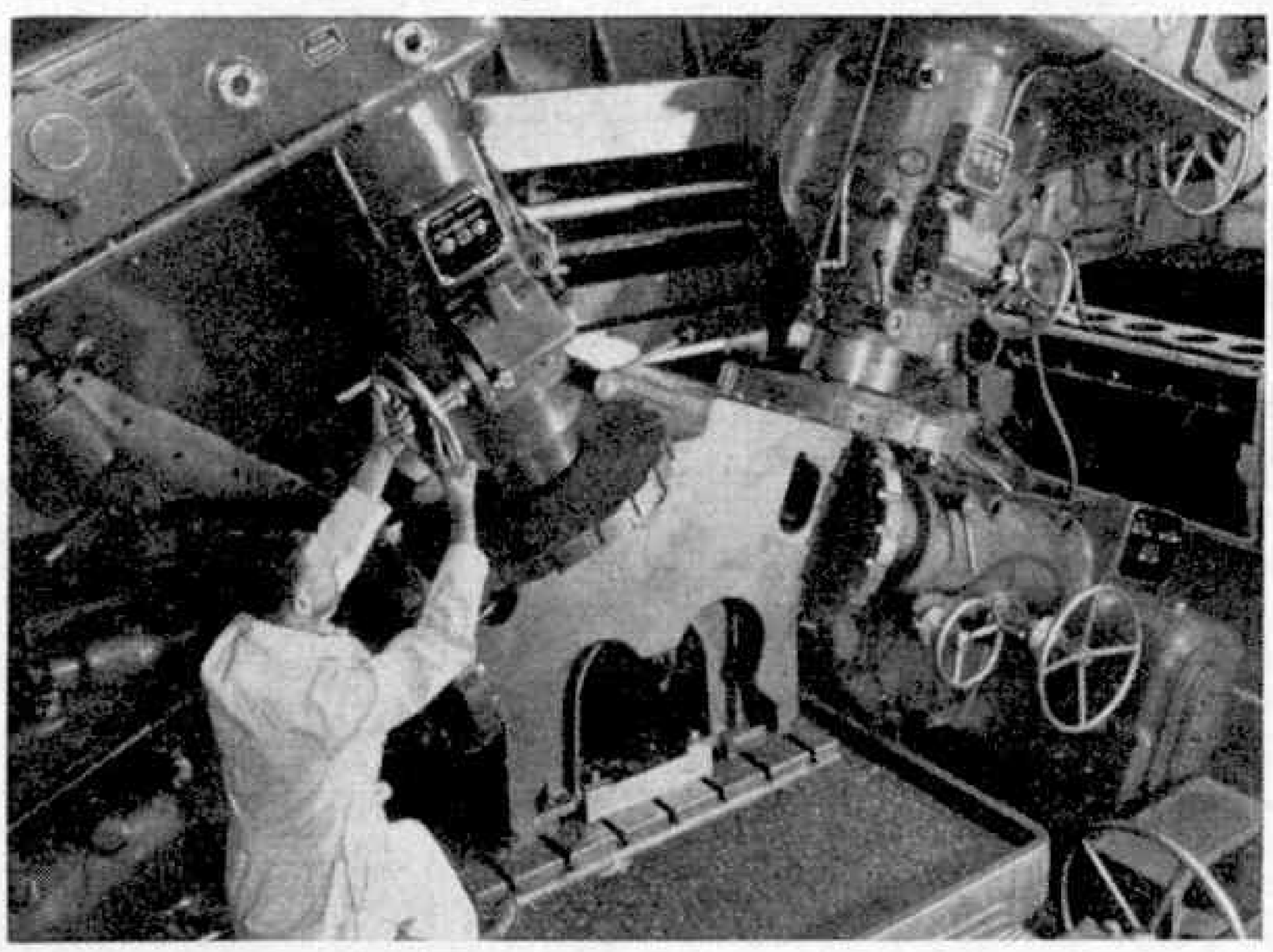
Parking allowed here! No sign is needed. Wherever there is a Hornby-Dublo Railway, there are the enthusiasts of all ages. This display was set up by Michael Glegg, age 13, who was helped by John Coppock, age 10, and the boys ran it faultlessly throughout the last Annual Exhibition of the Chester Model Railway Society.

The Editor

Making Heavy Diesel Engines

OUR cover this month is of outstanding interest, as it shows one stage in the making of one of the large diesel engines used for so many different purposes today. It is a scene in the work of Mirrlees, Bickerton and Day Ltd., at Hazel Grove, near Stockport. This firm has been associated with the production of diesel engines from very early days. As long ago as 1897 it built the first British engine of this kind ever constructed, which was in fact the world's third diesel engine, and ten years later a plant for building diesels was erected at Hazel Grove, near Stockport, in England, where a large range of these engines is now made.

The first steps in making a diesel engine are the provision of the castings for the bedplates, cylinder housings, cylinder heads and so on, and of such components as the forgings for the crankshafts. All these have to be machined very carefully to the exact dimensions required, and for this a vast range of machine tools is used, including some that have been specially constructed for Mirrlees.

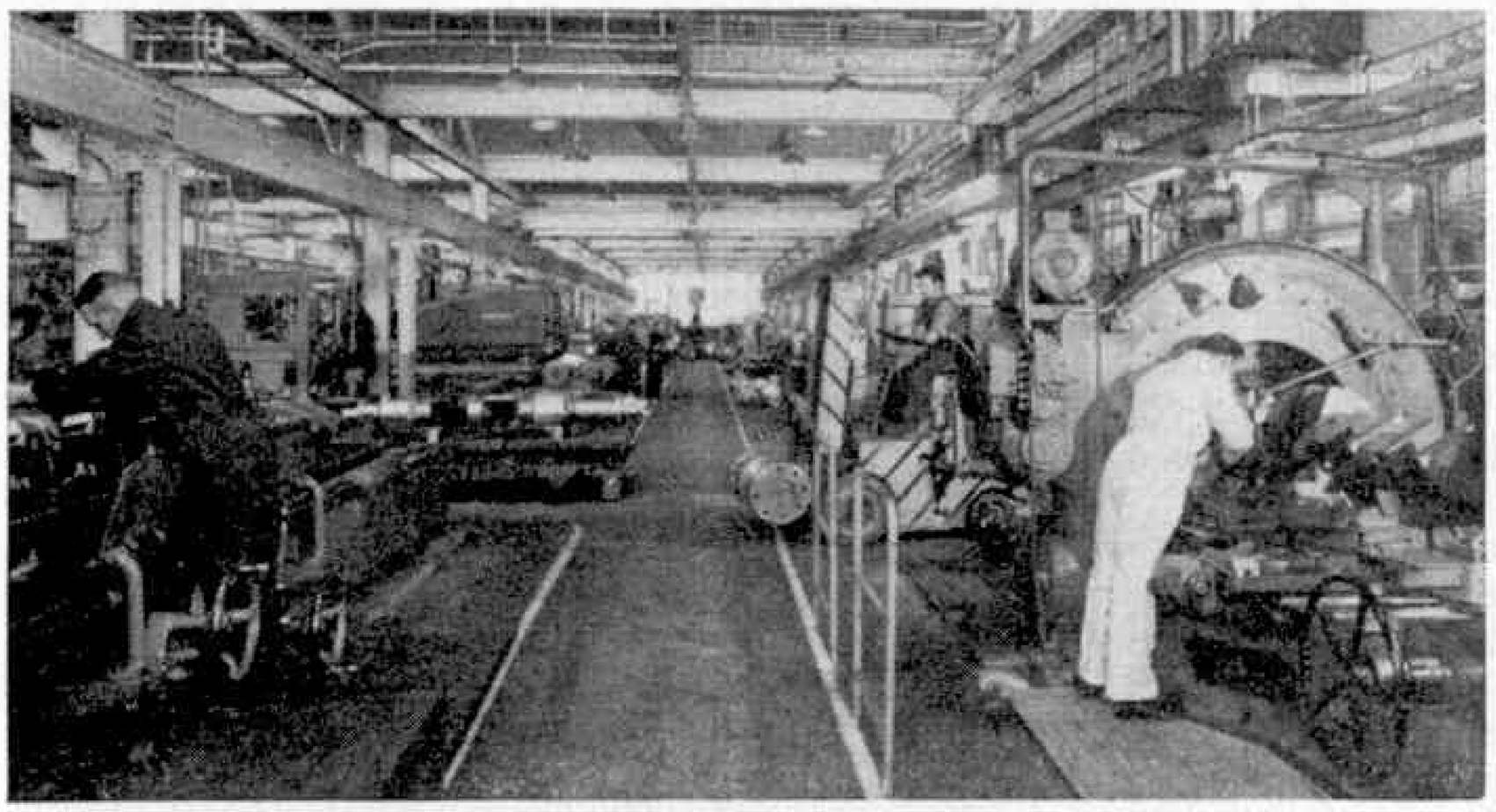


The four cutting heads of a plano-miller machining the faces of a cylinder housing for a large Diesel engine at the works of Mirrlees, Bickerton and Day Ltd., Hazel Grove, Cheshire.

The floor space of the works, which extend over about 400,000 square feet of covered area, has been planned to allow for the flow of production in the most modern manner. With one exception, the bays are equipped with overhead travelling cranes, and there are also electrically-operated jib cranes throughout the works to allow components to be passed from machine to machine. Every type of handling machinery indeed is employed, down to fork lift trucks for carrying small components, which are placed on pallets and stillages.

It is of course impossible in a single article to give a complete and detailed description of every stage in the production of a large diesel engine, or to describe the cutting of the large spur and bevel gears and countless other parts that go to the construction of the

Machining cylinder heads at Hazel Grove.



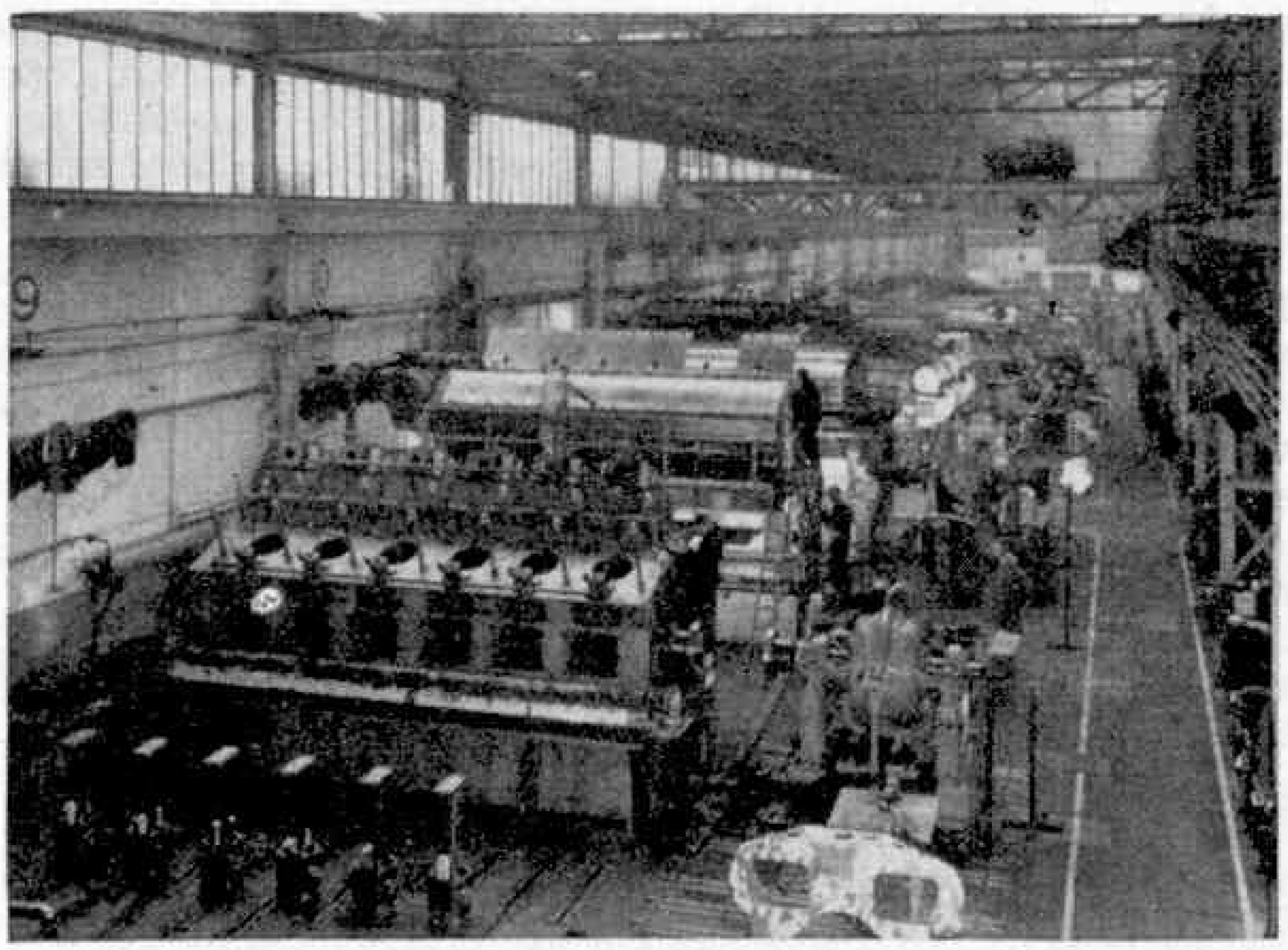
The crankshaft machining bay.

finished engine. Some of the more outstanding operations are illustrated in the accompanying pictures. For instance, the upper picture on the previous page shows the cutting heads of a plano-miller machining the faces of a cylinder housing.

There are four cutting heads in the plano-milling machine, each mounted at the exact angle required, and they machine four separate faces at the same time in one pass of the casting through the machine. The housing is securely fitted to the bedplate of the machine, and as the heads rotate they remove unwanted metal, working to extreme precision to ensure that the dimensions of the finished cylinder housing will be accurate and ready for assembly in the finished diesel engine in due course. Five of these plano-millers are employed in machining cylinder housings at the Hazel Grove works.

The cylinder housing shown undergoing this machining operation in the upper illustration on the opposite page is of course one for a Vee-engine, in which two sets of cylinders are arranged at an angle. The bores for these cylinder housings, in which the cylinder liners are located, are machined by an angular borer specially designed for this operation and made by William Asquith Ltd., Halifax. This indeed is the machine shown on our cover. As will be seen there, it has two spindles, set at an angle of 22½ degrees from the vertical, so that the Vee-form cylinder bores may be machined. These spindles perform roughing and finishing operations respectively in each of the bores.

The production of cylinder liners for the Mirrlees K range of engines is highly specialised. These engines are produced in both vertical in-line and Vee form, and their cylinders have bores of 15 in. and a stroke of 18 in. They are suitable for speeds up to 450 r.p.m. and their power range is from 192 to 3,060 b.h.p. Specially set up lathes and boring machines rough and finish their centrifugally cast iron cylinders, and after the bores of the liners have been machined these are transferred to a vertical honing machine, which gives the required finish and accuracy to the bores.



Test bays in which the final erection and testing of heavy diesel engines are carried out.

Finally the outer diameters are ground.

It is interesting to see the mighty crankshaft of a large diesel engine. This starts its life as a rough forging, which is machined in roughing lathes that are specially adapted to swing each throw of the crankshaft into line for the turning of the crank pins. These are finish-turned

(Continued on page 114)

Smoke-Jumping

By John W. R. Taylor

IT'S surprising how few people in Britain have heard of the smoke-jumpers of the U.S. Forest Service, because their story is one of the most interesting in the whole world of aviation.

It began, I suppose, back in 1905, when the Forest Service was founded, at a time when nobody but the Wright brothers had flown in a powered aeroplane. If a fire broke out in timber land, the forest ranger often had to tackle it single-handed with axe and shovel to try and check the spread of the blaze. At best all he could do was to round up a few local settlers on horseback or afoot to help him. As a result, many fires burned for weeks or months, until they were finally put out by rain or snow, and millions of acres of valuable timber were lost.

In 1912, someone suggested that aeroplanes might be useful for spotting forest fires and even to produce rain artificially to put them out. Unfortunately, the U.S. Army and Navy had between them about 15 aeroplanes at that time, and there are 450 million acres of American timber land; so the idea was not received with much enthusiasm.

Nevertheless, it did not die, and after the 1914-18 War, when there were plenty of aeroplanes and trained pilots, the Army Air Service decided to give aerial fire-spotting a trial. It was easier said than done, because the only aircraft available were none-too-reliable wood and fabric trainers. But the old biplanes did their job, and by the end of 1919 there was no longer any doubt of the value of fire-spotting from the air, although it proved to be less reliable than ground observation for detecting fires in the early stages.

Each year techniques improved and in 1928 the Forest Service began to call in private companies to help in fire-protection work. One of them was a small outfit run by a pilot named Bob Johnson in the Bitter Root mountain region of Montana, and the efficiency of modern forest fire-fighting from the air probably is due more to him than to anyone else.

Unfortunately, there is no room to tell

The picture at the head of the page shows a smoke-jumper, equipped with specially designed helmet, face mask and padded clothing, making ready for a jump from an aircraft. Photograph by courtesy of U.S. Forest Service.

of all the adventures that befel Johnson and his pilots as they flew their frail aircraft through treacherous mountain air currents in forest country where engine failure often meant certain death. They flew down winding high-walled gorges to deliver urgently-needed freight and to pick up injured people; carried men, mail and supplies into tiny clearings hacked out of the forest and, in winter, landed their ski-equipped planes on frozen lakes or snow-covered airstrips; and dropped into almost inaccessible places all the materials needed to build look-out towers.

Fire-fighters were occasionally flown to clearings near a blaze; but, more often than not, the fires were caused by lightning miles from any place in which an aeroplane could land, so that the men had to travel long, wearying distances before they could start tackling them. Food, camp equipment, tools and medical supplies had to be transported by pack animals, and by the time they arrived the fires were usually off to a good start.

Bob Johnson began dropping supplies from the air to fire-fighters in the early 1930s, and ran into plenty of problems. Hot air currents and smoke from the fires

Instructors on the ground at a school for smoke-jumpers watch trainees make their first jumps, into an area of young trees.

made the aircraft buck and sway, so that it was difficult to aim the bundles into tiny open spaces where the men waited. Much of the equipment was smashed against outcrops of rock or lost in the dense timber.

Improved methods of packing cut the losses from breakage; but it was not until Lage Wernstedt of the Forest Service developed simple home-made parachutes made of burlap in 1936 that fragile supplies, including even eggs, could be dropped safely. It was an important milestone in forest fire-fighting. Within a few months, 60 tons of equipment and supplies were dropped to a fire in the Wallowa National Forest, Oregon. They enabled 200 men to tackle the blaze immediately, instead of having to wait several days for the arrival of 50 pack horses, and the cost was less than if the animals had been used.

Soon parachute supply was an accepted practice; and other developments followed. Hot food and drink were dropped in vacuum containers. Experiments were made in dropping water or chemical bombs on to fires. Trained observers began to fly over the fires, to study their intensity, location, extent, rate and direction of burning, to see if there were any natural barriers to the flames' spread to help the men on the ground, and to look for the best routes of approach.

Photographs were taken, developed and printed in the air and dropped to the fire-fighters. In Montana, on one occasion, forest officers photographed a blaze and dropped an 8×10 in. print to the ground within 18 minutes. More up-to-date and informative than any map, it greatly speeded the work of the firemen. Later, two-way radio communication was introduced to ensure even quicker, closer liaison between the observer in a circling aircraft and the team on the ground.

By 1939, therefore, the aeroplane had become a necessity, not a luxury, in forest fire-fighting. The only job it could not do was to deliver the fire-fighters to the doorstep of a fire.

Once again, it was Bob Johnson and his colleagues who found the answer. They had for some time been using old Army Air Force parachutes to deliver supplies, and had learned to drop them with almost pin-point accuracy, so that they were seldom if ever lost. Several of the men considered it would be worth the risk to parachute fire-fighters to a blaze, to catch it in its early stages, and, as an experiment, dummies weighing

During instruction at the school the trainees are required to land on progressively more difficult territory. Here several pupils are seen aiming for a small meadow surrounded by trees.

about the same as a man were attached to ex-Army 'chutes and dropped from different heights. All went well, so it was decided to make "live" tests with professional parachutists.

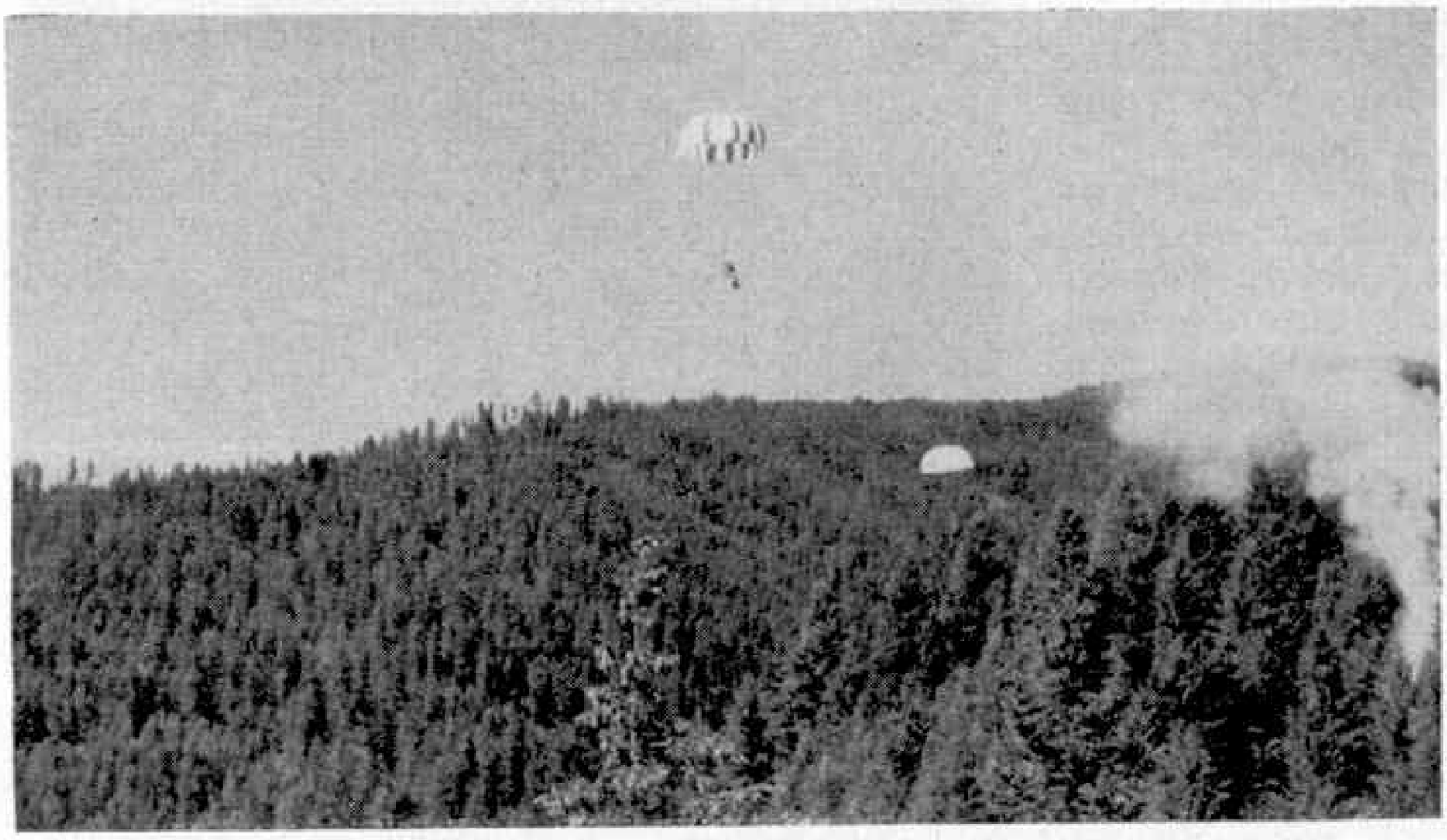
At first, the drops were made on to fairly open ground. Then, one day came the mistake that everyone had dreaded. Some of the parachutists misjudged the strength of the wind and drifted down into clusters of tall trees. Surprisingly, they reported the softest landings they had ever made and, since then, it has been normal practice to fall on to some of the tallest, bushiest trees, which the men call "feathers".

Soon the professional parachutists were joined by local forest fire-fighters who had never seen a parachute before. Wearing specially-designed helmets, face masks and padded clothing, rather like the equipment worn by baseball players, they jumped with complete success on to mountain meadows, rough slopes and ridges and even into dense forests, in country that varied in height from sea level to 8,000 ft.

During October and November 1939, 58 jumps were made in and near the Chelan National Forest, Washington, the parachutists being followed in their descent by parachuted fire tools and supplies. Properly equipped, they were ready to tackle a fire in record time, keeping in touch by radio with their local headquarters. Convinced of the possibilities of "smoke-jumping", as the technique became known, the Forest Service bought 16 proper parachute outfits and trained two teams of eight men, one in the Chelan Forest and the other in the National Forests of Montana and Idaho—Bob Johnson's territory.

The stage was all set for more experimental drops when the National Forests of the Northern Rocky Mountain Region were peppered with thousands of fires caused by lightning. Instead of practice, the smoke-jumpers went to the real thing. By the end of 1940 they had jumped to more than a dozen fires in remote regions and had promptly controlled every one of them.

The technique they used has hardly changed since then and is very simple. The aircraft flies across the spot where smoke is seen rising from the trees and, at what he considers the right moment, one of the parachutists throws out a small burlap test parachute weighted with a 10 lb. sandbag. As it drops, the pilot circles and estimates the wind drift, then makes a wide circuit, flies back towards the smoke as straight and level as possible and tells the parachutists when to jump.



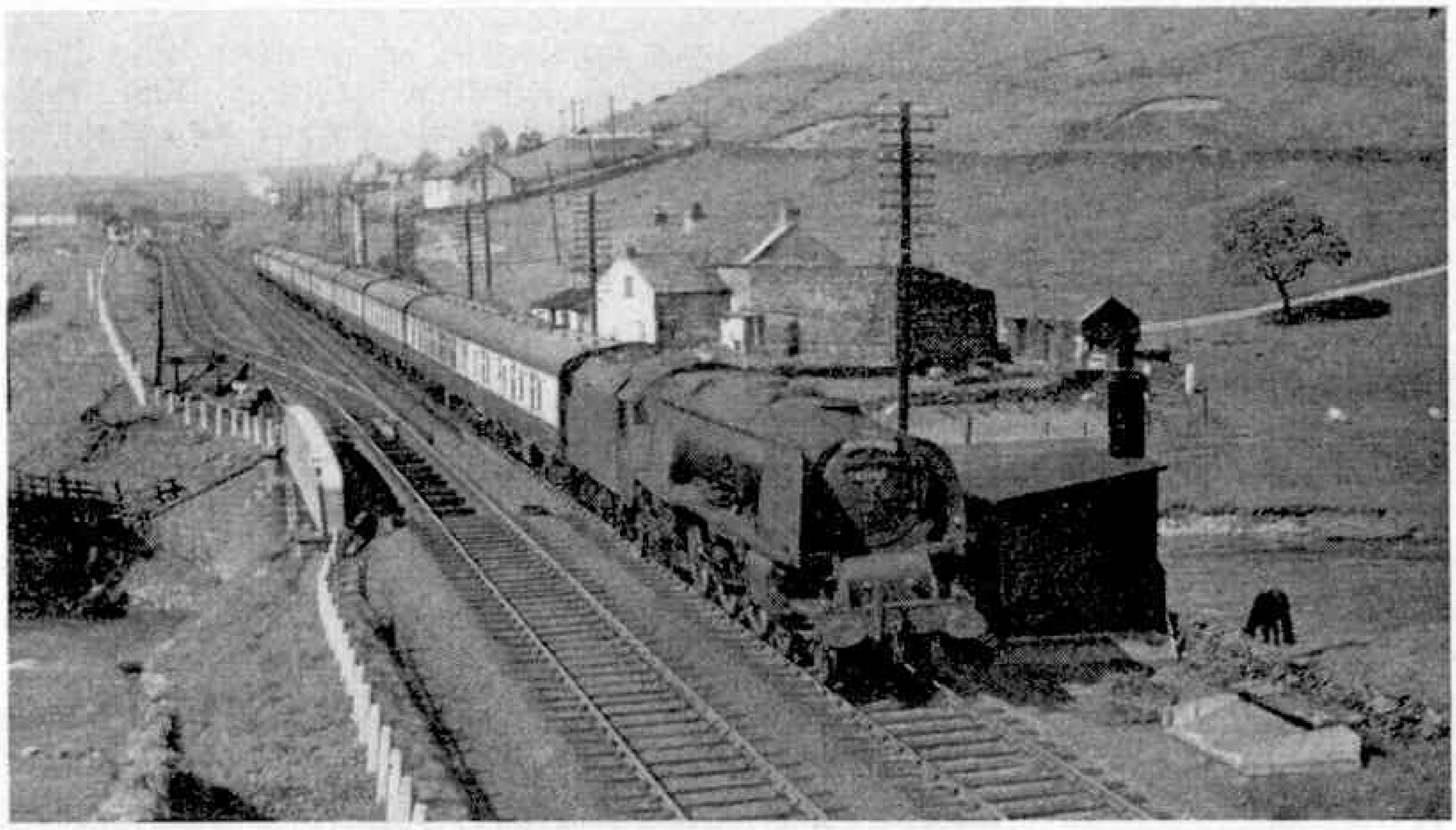
Two smoke-jumpers, one seen against the sky and the other against the trees, descending to a forest fire. Photograph by courtesy of U.S. Forest Service.

They normally land within 50 to 200 yards of the aiming point, and, as soon as he sees that they are safely down, the pilot makes another circuit and drops a burlap 'chute carrying tools, lamp, two days' rations, first aid kit, water canteen and other equipment. The entire operation takes probably five to ten minutes.

The parachutes used by the men are of a special type, 30 ft. in diameter, with a wide scalloped edge to ensure a slow rate of descent and as little swaying as possible, and with two long flaps for steering. Personal equipment includes a knife and a rope with which the jumper can lower himself to the ground if he ends up in a high tree.

When America entered the war, the U.S. Army based the training of its parachute regiments on that of the smoke-jumpers, whose activities increased year by year. In the first post-war season, the Forest

(*Continued on page 114*)



Runs on Anglo-Scottish Expresses

A Splendid London and Edinburgh Round Trip

By R. A. H. Weight

THERE are two great steel highways between London and Edinburgh—the West Coast and East Coast routes, and late last summer I travelled over both in a fascinating round trip.

I travelled north over the West Coast route by the *Midday Scot*, leaving Euston at 1.30 p.m. The engine that was to take us to Crewe was one of the earlier Stanier Pacifics, No. 46212 *Duchess of Kent*. The fine looking train consisted of 13 coaches, including three at the back to be detached at Carlisle, weighing 423 tons, or 450 tons including a full complement of passengers with their luggage. Most of the seats had been reserved in advance, a wise step, when possible.

The run down to Rugby was rather unfortunate. The timing is very fast, but there were three long slowings, just where speed could have been high, on account of track repair or similar work, and then came adverse signals, so we were over 15 min. late when we stopped at Rugby. But smart platform work got us away in 1¾ min. and a spirited effort by engine and crew, with no delays, gained no less than 7½ min. on to Crewe. Indeed the 75½ miles were covered start to stop in 69½ minutes! There were several 80 m.p.h. spells and minima not less than 65 up the rises.

The illustration at the head of the page shows the up Midday Scot passing Tebay, headed by No. 46246 "City of Manchester." Photograph by the Venerable E. Treacy.

At Crewe, where there is always a lot of traffic and locomotive interest, as it is a great junction for North Wales, Manchester, Shrewsbury, the Potteries, etc., we had to await the arrival of the West of England connection. This brought two loaded through Plymouth-Glasgow coaches for attachment in front of the *Midday Scot*, making a 15-load or 520 tons, full up.

The Crewe Pacific of the large and later series, No. 46252 *City of Leicester*, took over this big train, still unavoidably late. As far as Carnforth, 236 miles from London, 78 from Crewe, the grading of the route is easy on the whole, but there we plunge into the Pennine and moorland area, and there are steep climbs. Up the first hard pull through the fells to Grayrigg, finishing at 1 in 106, the minimum speed was 42 m.p.h., and on the stiffer 1 in 75 up to Shap Summit my stopwatch recorded 39, 36, 35 and 34 m.p.h., and then nothing lower to the top, a fine performance unaided with such a load. We were stopped momentarily by signal 11 miles from Carlisle, but reached that station at 7.17.

So far we had been on what until the grouping of railways was the London and North Western Railway. Now we passed on to the one-time Caledonian Railway,

Train water tanks and the engine tender were replenished, and in the evening sunshine No. 46252 and her Crewe driver and fireman, who were working through to Glasgow, were soon off again along the levels of the Eden valley and its associated low country.

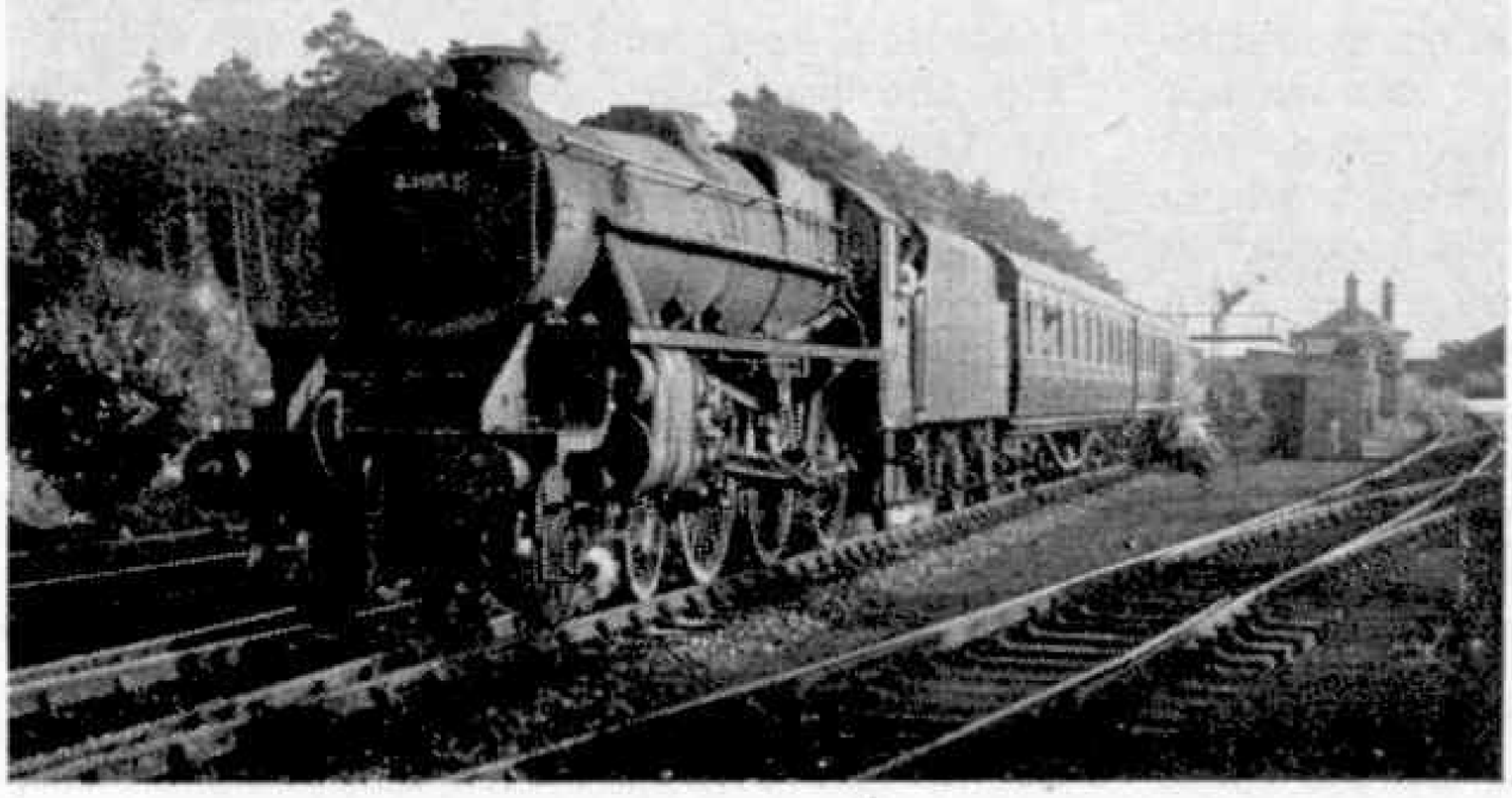
We crossed the border near Gretna Junction, with speeds of 70 and over, and passed woods and heather before facing the severe climb to Beattock summit, a sort of mountain pass, with a road alongside, that took us to a height of 1,015 ft. above sea level, as announced on a board attached to the front of the substantial signal box at the summit. There too are sidings, partly to accommodate banking engines needed for many freight and other trains. Fast freight trains carrying fish, meat and important goods flashed past heading south, to travel on during the night.

Beattock bank is 10 miles long, largely at 1 in 80–75! *City of Leicester* could be heard roaring up into the wild country, only gradually dropping to a momentarily lowest speed of 32 m.p.h., to be succeeded by a maximum of 72 downhill before stopping at Carstairs. The timing, the fastest of its kind, had been decidedly improved upon by this engine.

I left the Glasgow express at Carstairs to join a two-coach non-stop connecting service to Princes St. Station, Edinburgh, hauled by an L.M.S. 2–6–4T. We headed south at first, but soon curved away to the north-east on another hilly line past pretty country stations like the one illustrated, with distant mountain or hill views, and so through the suburbs of the Scottish capital to the small but centrally situated terminal, 27 miles from Carstairs and 400 from Euston, just before dusk gathered over the romantic and imposing city of Edinburgh.

The down Midday Scot climbing Shap. The locomotive is No. 46229 "Duchess of Hamilton." Photograph by the Venerable E. Treacy.

The vast Waverley station in its valley was formerly the property of the North British Railway, and later of the L.N.E.R., and is situated on the through East Coast route. Nearly all first and third class seats were booked in the beautiful and spotless *Elizabethan* train, which I boarded next morning with a rather thrilled feeling of anticipation, since it is a unique and outstanding express in several respects, running during summer in advance of the *Flying Scotsman*. It is not only scheduled to make the longest non-stop run in the world, over the 393 miles each way between the English and Scottish capitals, but it is also decidedly the fastest Anglo-Scottish express. By a large margin it is the



A two-coach Carstairs-Edinburgh train, similar to the one which the author travelled on the trip described in this article. Photograph by G. H. Robin.

only one to average over 60 m.p.h. for such a long distance, as the allowance is only 390 min. or 6½ hrs. It is also unique in that the drivers and firemen change about half way by means of the corridor tender and vestibuled connection to the train.

Our train included two through carriages from Aberdeen and Dundee. It had first and third class restaurant cars, a buffet lounge car of novel design and other very complete amenities, including some air conditioning, and the heavy 11-coach set weighed 403 tons empty or about 423 tons including passengers, luggage, staff and stores.

A rather famous member of the record-breaking A4 streamlined 4–6–2 engine class was ready in front. This was No. 60033 *Seagull*, of King's Cross shed, which achieved many runs on that arduous duty in 1955. It is usual for King's Cross, London, and Haymarket, Edinburgh, A4s to work the train each way on alternate days, with crews from those depots sharing each journey. When off duty they travel in a reserved compartment, take a meal in the restaurant car and are free to change into ordinary clothes!

Space permits only a brief summary of a splendidly steady, fast run. We were soon up to more than 70 m.p.h. as we wound round the coast, passing Dunbar, 29¼ miles, in 30 min., and topping Cockburnspath bank, 1 in 90, the steepest on the route, at 40 m.p.h. We enjoyed grand sea views and fine cliff and woodland scenery as we crossed the border, passed cautiously through Berwick-on-Tweed and over the curved and lofty Royal Border Bridge.

Fast travel again and the mile-a-minute average was being maintained as we approached the Tyneside industrial belt with its local electric trains, many branch or connecting lines and more great bridges. At much reduced speed we passed outside the platforms of the Newcastle Central station—124½ miles in 127 min. Uphill we went at 60–58 m.p.h., and soon came the imposing view from the elevated railway embankment in Durham of the Cathedral and University high on another rocky hill.

Again came a speed restriction, but we were soon pelting away towards the Tees and the great plain of York, passing outside Darlington station at 65 m.p.h., along the fast tracks, about 30 sec. late. The almost level 44 miles on to York, that busy high-speed section of the main line, provided an opportunity to get a valued minute or two in hand, and to secure the preponderance of miles over minutes essential to keep time. They were reeled off in 35¾ min., with a sustained maximum of 82–83 m.p.h., to take the *Elizabethan* slowly through the big, curved York station two minutes before time at 1.5 p.m., or in 200 min. for 204½ miles from Edinburgh.

Meanwhile the drivers and firemen had changed. We had passed the northbound sister express approximately half way to London. With much of railway and other interest flashing by, we went impressively on through Doncaster and Grantham. Owing to a long stretch of track in hand for relaying, with a restriction imposed, there was no chance of reaching an exciting high speed down that part of Stoke bank which has seen most of the A4 and other records achieved, our maximum being 79 m.p.h. Through Peterborough we went slowly at 2.56, 316½ miles in 312¼ min., followed by some grand locomotive work over undulating gradients and level track, so that as we approached Hatfield at 66 m.p.h. 375 miles had been covered in 366 minutes.

An impressive shot at speed near York of "The Elizabethan," headed by No. 60033 "Seagull." Photograph by C. Ord.

(Continued on page 114)

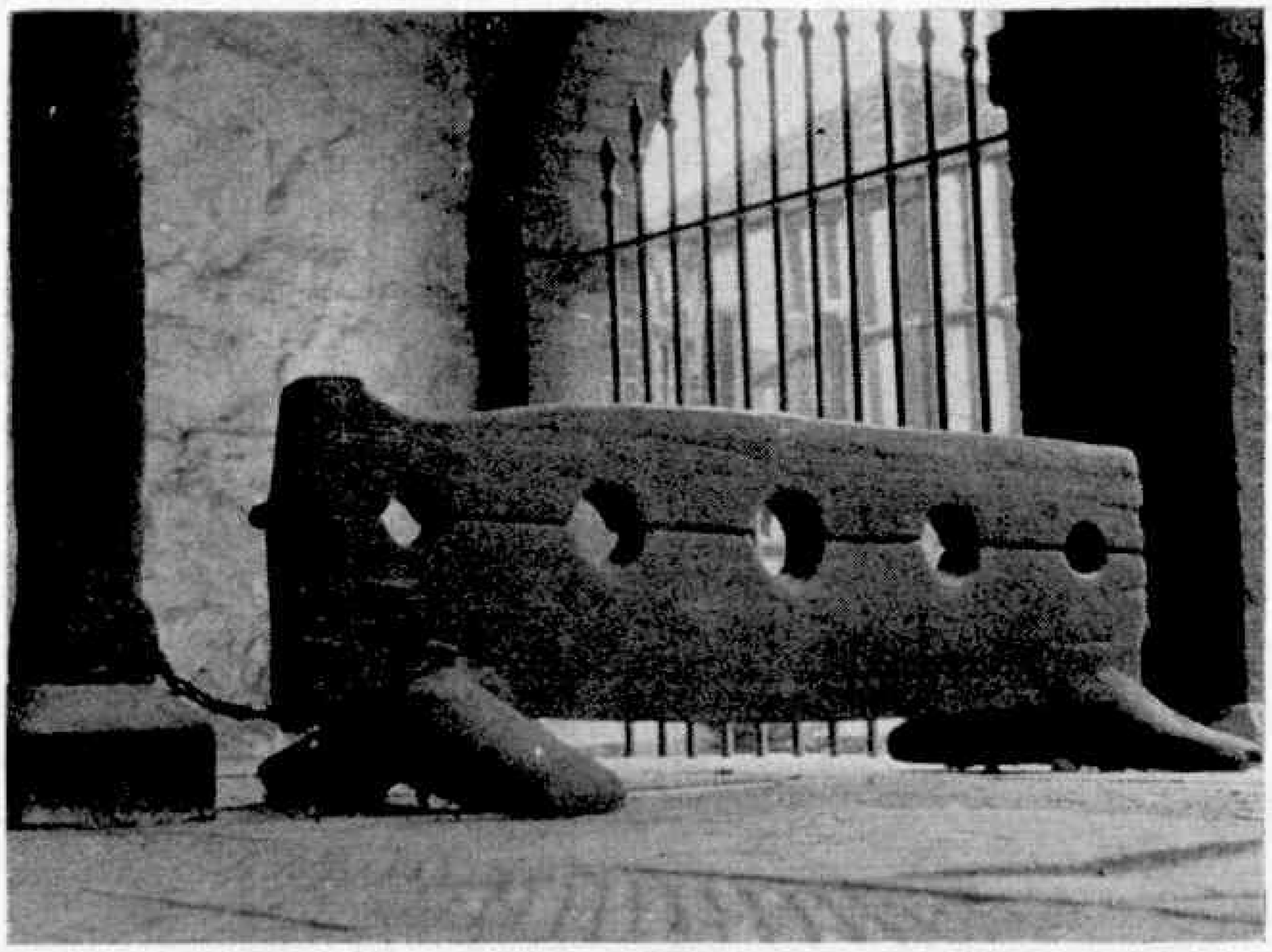
Punishments to Fit the Crime

By Reece Winstone, A.I.B.P., A.R.P.S., F.R.S.A.

MANY relics of old time are still to be seen around the countryside, and one of the most picturesque of these is the ducking stool preserved in the church at Leominster, Herefordshire. It was the last one to be used in this country. This ancient instrument of punishment was used to chastise common scolds, and for butchers, bakers, brewers, apothecaries and others who gave short measure or sold adulterated articles of food.

Jenny Pike, alias Jane Curran, was ducked in a stream at Leominster in 1809, and is the last recorded person to be so punished.

The pillory is another instrument of punishment little used today. Coleshill, Warwickshire, preserves one complete with whipping post in the centre of the town. This example held two victims. There was a large hole for the head of each victim, with two smaller holes for the wrists, and aloft the miscreant would stay, the butt of any ripe fruit the populace cared to throw. Looe in Cornwall can show us just a board with four holes, set in the gable of the ancient Guildhall.



The stocks of Brading, in the Isle of Wight, are preserved under the Market Hall. They have five holes. An explanation of this unusual feature is given in this article.

Scotland has its own version of a pillory, known as the jougs. This is a metal halter for the neck, and was first used in the 16th century. It is a ring or collar that could be opened on a hinge when a culprit's neck was to be enclosed. One of these hangs on the wall of the Pictish Round Tower, Abernethy, Perthshire.

Turning to more serious crimes, when the extreme penalty was demanded, the last gibbet in England stands 1,010 feet up on the summit of Inkpen Beacon, near Hungerford, Berks. It was erected in the 17th century for the special purpose of hanging a man and woman who had murdered two children and thrown their bodies into a pond. It is the third on the spot. The first rotted away and the second was struck by lightning in 1852.

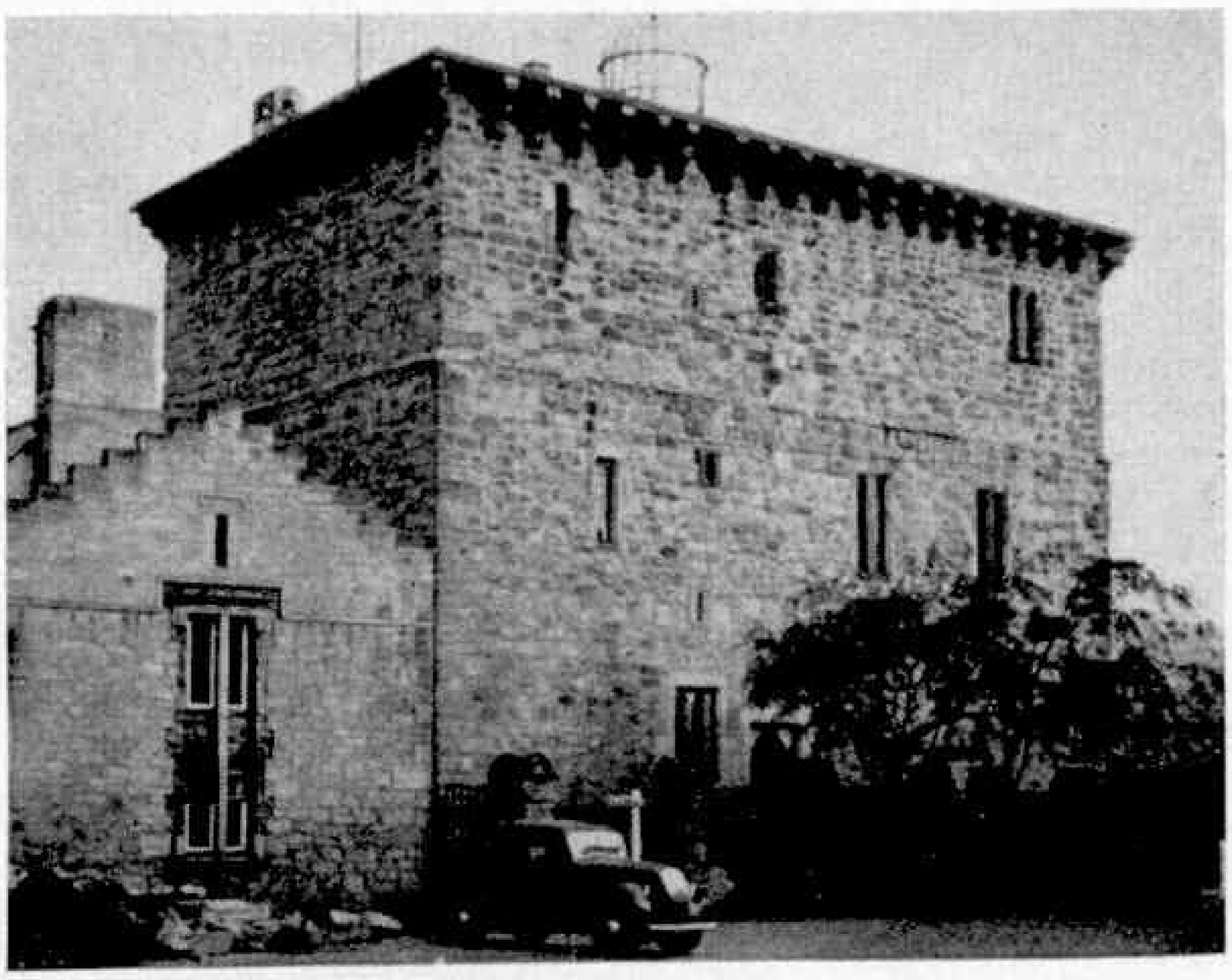
Visitors to Montacute House in Somerset, a lovely National Trust property, are shown a unique bas relief in the Hall, depicting the "Riding of the Skinnington". Stretching across one end of the long panelled room, it shows a husband tied to a pole and paraded round the village green because he allowed himself to be hen-pecked by his wife. On the left is seen the old village gossip who discovers the wife scolding her husband; the reason may be that he took the baby with him to the cellar to draw off beer, for so he is depicted. Possibly only the hen-pecked husbands of mediæval times minded the baby, anyway. The old gossip is seen again, last on the left of the large group.

Before the mediæval miscreant was brought before authority, it was necessary to keep him under lock and key. Hence the old lock-ups that still linger on in our ancient villages. Perhaps the most striking of these is the building that was originally a bridge chapel at

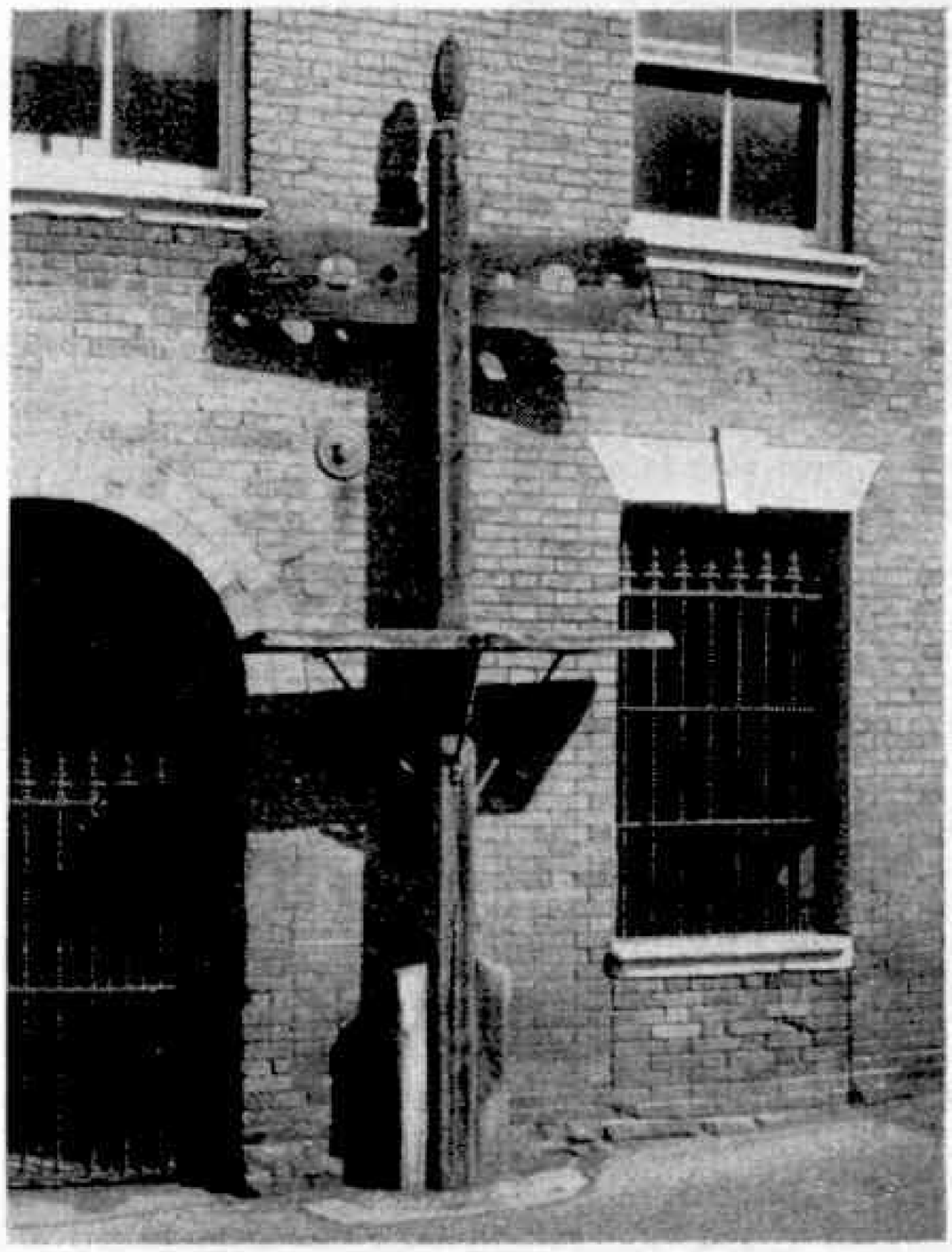
Bradford-on-Avon, Wilts. One of its occupants was John Wesley, who spent a night there. The dome's stone roof is capped by a fish weather-vane, known as the Bradford Gudgeon, and because of this a man locked up was said to be "under the fish, but over the water."

There was a great building of these "Round Houses" in the Georgian era, and in nearly every case the recognisable feature of the period is the ball on the top of the structure. Castle Cary, in Somerset, has one that is reminiscent of a modern policeman's helmet. With walls three feet thick, it was built in 1779 and used until 1855. It cost £23 to build. There is a stone slab inside for a bed, and light and air come through a tiny grating over the door. It was used in 1795 to confine children over 7 years of age found in the streets.

Wheatley, near Oxford, carries its Georgian ball on the top of a cone-shaped building. Its shape and its Cotswold stone walls three feet thick made it a perfect air raid shelter in the recent war. The villagers of Box, Wilts., built their round house between the two local inns, the easier to collect those worse for drink!



Here is perhaps our oldest country prison. It is at Hexham, Northumberland, and its size is in surprising contrast to that of the village lock-up described in this article.



The whipping post and pillory of Coleshill.

Late in the 19th century it housed tramps. Then a minor fire nearly asphyxiated the inmates, as there was no window or ventilation of any kind, and its use then ceased.

Other "Strongholds" may be seen at Pensford, in Somerset; Heytesbury, Wilts.; and Bibury, Glos. Sark, in the Channel Islands, has one, but this hasn't been used for years as the local folk are so law abiding.

Petersham, Surrey, has a building dating from 1792 that was erected with a double purpose, to provide both a lock-up and a watch-box of the kind used by village watchmen before the days of the police force. A giant in gaols is at Hexham, Northumberland, and as it is 600 years old it may well claim to be our oldest country prison. It is as tall as a modern five storey house.

Examples of another old time form of punishment, the stocks, remain in many places. Brading, Isle of Wight, can show an unusual set, with five holes! The local story is that a one-legged gentleman was so often in the stocks that a special central position was provided for him, leaving two holes on either side for each of his colleagues!

Racing Traction Engines

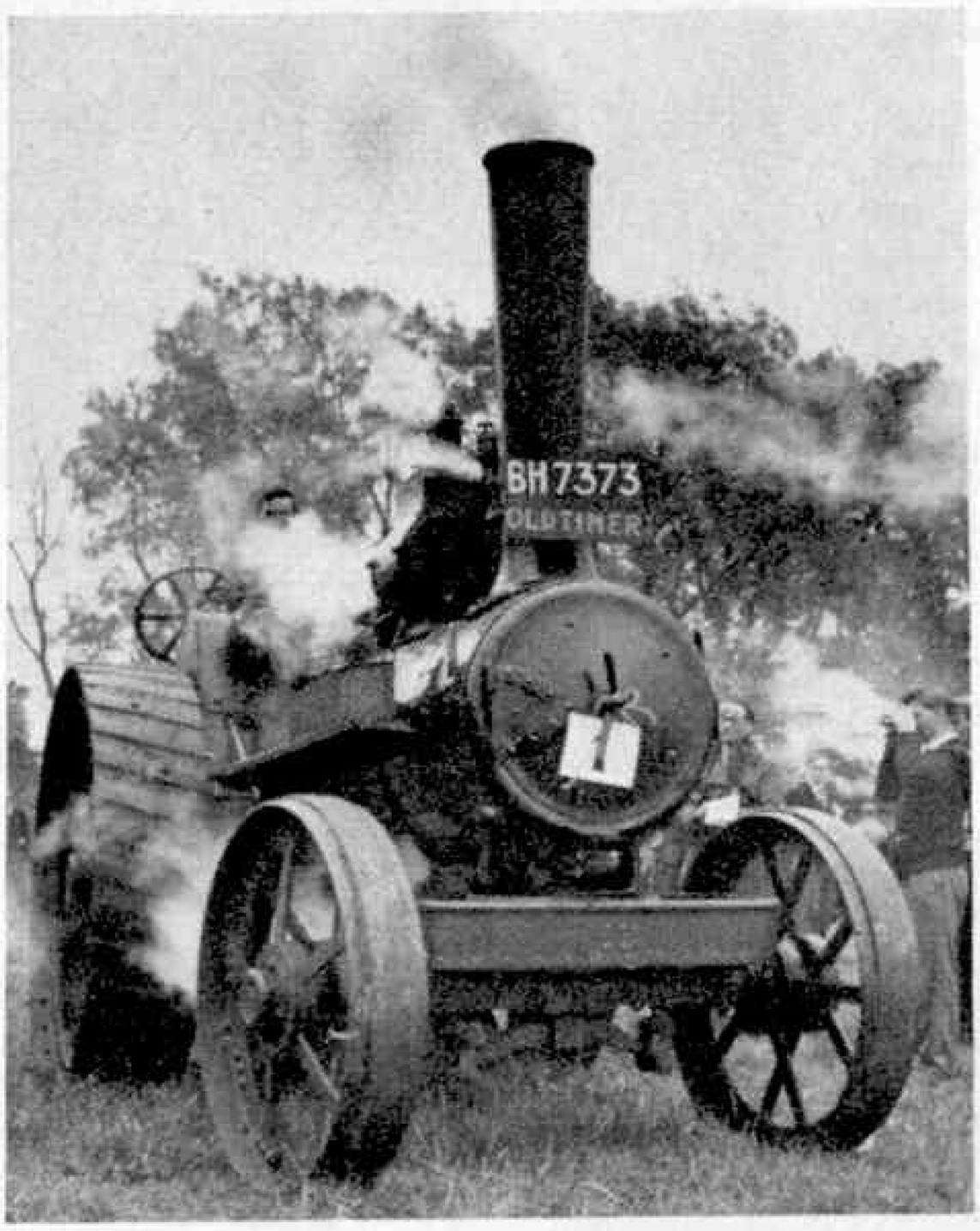
Speed Records in Unique Rallies

By I. J. Belcher and L. Kent

FOUR years ago two farmers in Berkshire, Mr. Arthur Napper of Appleford and Mr. Miles Chetwynd-Stapylton of Didcot, were discussing the merits of their steam traction engines. Carried away by enthusiasm for the speed at which these ancient contraptions could travel, they allowed the pride of ownership to get the better of discretion, and a challenge was issued. The stake was a firkin of beer.

The first race was held in a field at Appleford, watched by only about twenty spectators. The winner was Mr. Napper, with his 1902 Marshall Engine, *Old Timer*.

Thus was born the Traction Engine Rally. Dr. Giles Romanes, a member of the staff of the East Grinstead Eye Hospital, heard about the race and threw down the gauntlet on behalf of his *Eileen*, a 1919 engine. *Old Timer* and *Eileen* met the following year at Nettlebed, and although conceding seventeen years, *Old Timer* romped home an easy winner, at four minutes a mile.



"Old Timer" in the paddock, about to take part in the first steam traction engine race.

This meeting was a bigger affair than the Appleford race. Quite a large crowd of spectators turned up, and the race was started by Lord Nuffield. There was a brush with the law over a small matter of licensing. A court case followed. No one knew into what taxation class a racing steam-engine should go, but a precedent was duly established in court for the guidance of magistrates in future disputes, and a rich piece of traction engine lore was brought into being.

But the Nettlebed event established traction-engine racing. Enthusiasts from all over the country today descend upon quiet Appleford. One competitor recently sent his engine on in advance with a stable-lad, and arrived just before the meeting by aeroplane. The traction engine enthusiasts are now controlled by a National Association and meetings are run on car rally lines.

For the first time such things as the safety of competitors and spectators were taken into serious consideration. There was no out and out flat racing, for fear of fly-wheels hurtling off into the crowd or of boilers blowing up. This timid attitude spoilt later meetings for those who had seen the earlier races. They had been thrilled at the prospect of a calamity of some sort and found the new safety-first approach insipid. But a vast new audience now views the rallies through television and newsreel cameras, and Traction Engine Rallies have become national events.

There are now four rallies a year. At a recent Committee Meeting, advance plans were discussed and a provisional programme was drawn up. Several new events were suggested, not least one that is a game of Steam Polo combined with Tilting the Bucket. But Appleford is still the premier event. After all, that is where it all started.

Like all enthusiasts, traction engine men are slightly mad about their hobby. You might think that one engine was enough for anyone. Not a bit of it! They collect

Traction engine rallies can be good fun. Here "Goliath" is giving a crowd a ride.

them like postage stamps. They swap them, cosset them, swear at them, boast about them, lie about them, and spend long hours painting and cleaning them.

As time goes by, engines become more valuable; and apart from their everyday uses for threshing and for hauling goods such as timber, bricks and flour, they are considered a good investment.

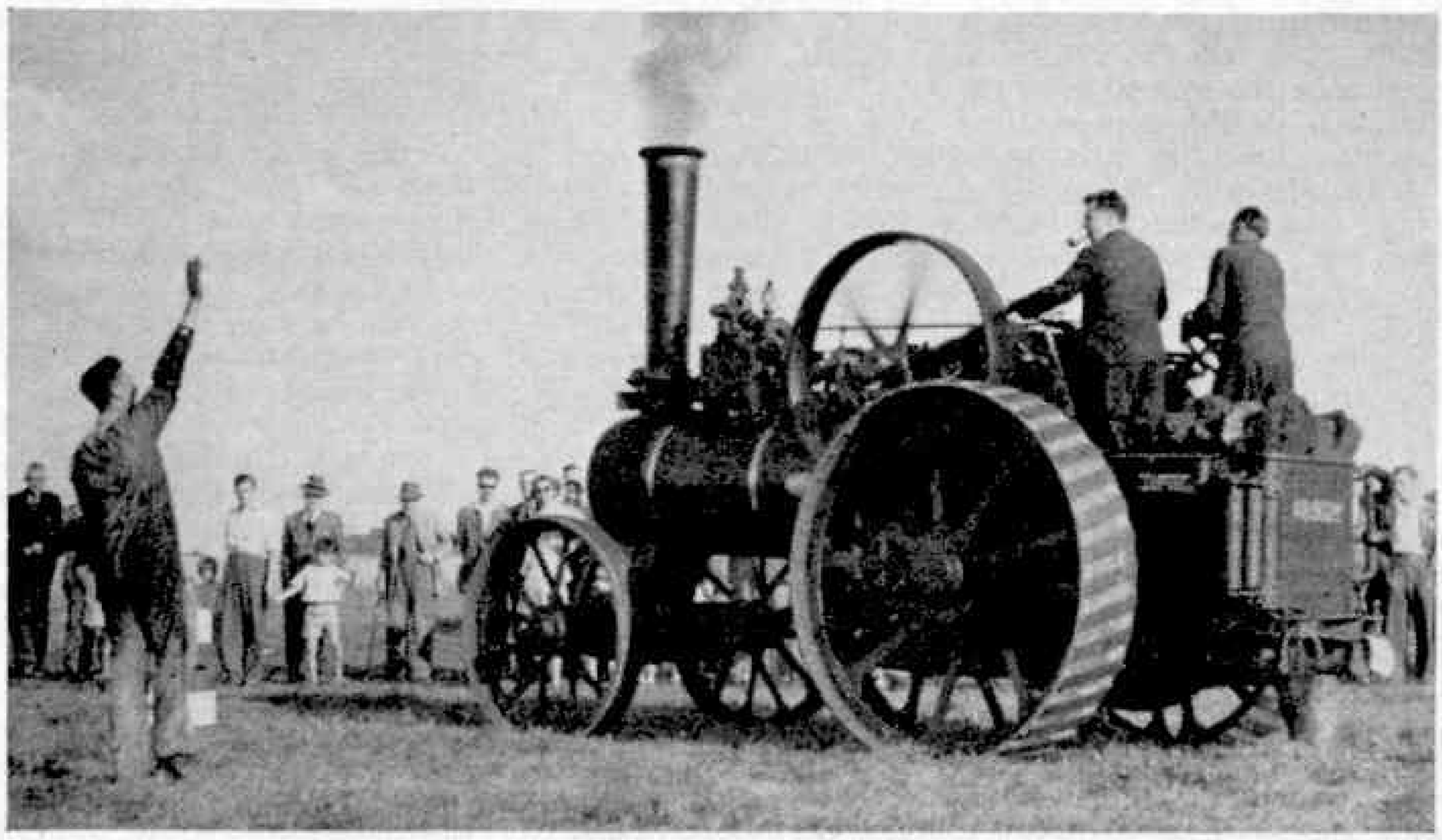
The lives of these engines have been varied. *Old Timer* was used for threshing by a firm of agricultural engineers. *Farmer's Friend* was used by the War Department during the 1914-18 War, and afterwards sold as a threshing engine, serving in this capacity until 1946. It was bought by its present owner as scrap, and subsequently re-built, with a new smoke-box and footplate, new motions and piston rod, and a re-tubed boiler. *Lady Raglan* was originally a showman's engine, and recently has been fitted with a new smoke-box and re-tubed.

An unusual feature of this engine is that the motion work is enclosed in an oil bath. *King George VI* is a 1913 Burrell and a real showman's engine. It was bought by its present owner in 1951, when it was dismantled and completely re-built.

The British Ministry of Fuel has smiled benevolently on these rallies, and provides a permit for ten tons of special steam coal for each of them. This is fuel that burns slowly and thus helps maintain a good "head of steam". Ordinary household coal is not suitable.

There is no need for these enthusiasts to find excuses for their hobby. Despite all appearances to the contrary, they have fun. They love telling each other how they got stuck half-way up Hagbourne Hill, or ran out of coal in the middle of Salisbury Plain during a thunderstorm in the middle of the night, or hurtled out of control at fifty miles an hour into High Wycombe.

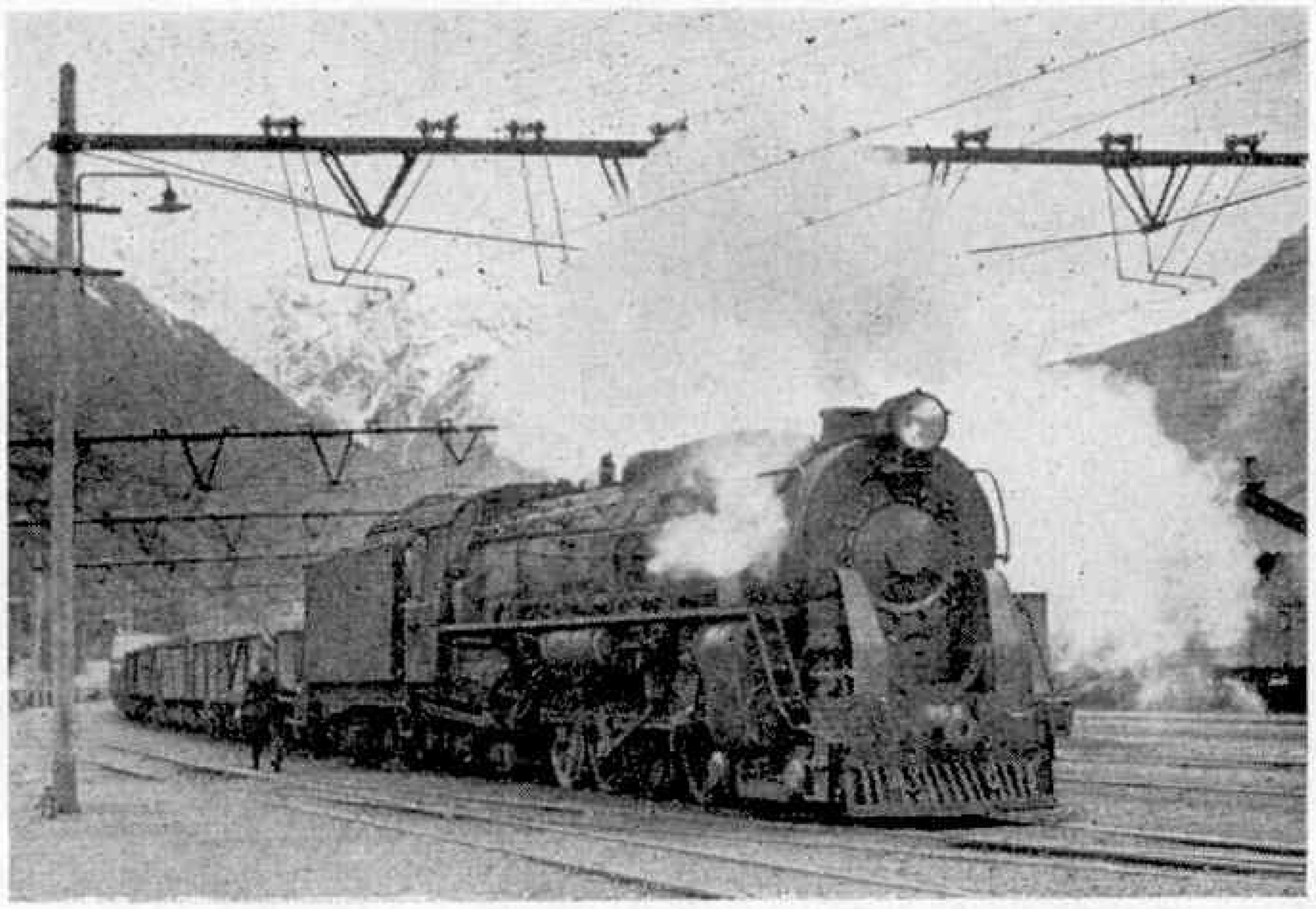
Britain's latest rallies have come to stay, and the originators of them are proud of the fact that they provide ever increasing funds for deserving charities. In particular, contributions that have been made to the magnificent work carried on at the Eye Hospital at East Grinstead, too, have helped sufferers to make a new start in life.



A Fowler engine crossing the finishing line in a race in which it beat "Old Timer"

Railway Notes

By R. A. H. Weight



Aboard the "Bournemouth Belle"

Each of the three Divisions of the Southern Region boasts a daily fast train, composed of Pullman cars, running throughout the year. The Eastern Section has the *Golden Arrow* Continental express; the Central, the electrically operated *Brighton Belle*, making several journeys each way daily; and on the Western, the *Bournemouth Belle* makes the longest runs, over the 111½ miles each way between London, Waterloo, and Bournemouth, West, calling at the central stations in Southampton and Bournemouth. The departure of the last-named train from Waterloo is at 12.30 p.m., and from Bournemouth, West, 4.34 p.m. The same locomotive and engine crew stationed at Nine Elms make the round trip, working it throughout.

It was foggy in London last autumn when I made my southbound journey to Bournemouth. Including a number of 12-wheeled cars, in one of which I rode very comfortably, and with baggage van on rear, the load was 11 vehicles, or about 425 tons in all behind Battle of Britain 4–6–2 No. 34077 *603 Squadron*. *City of Edinburgh*, temporarily operating away from its home station at Ramsgate.

As the engine was a light Pacific instead of the more usual Merchant Navy, there was less in hand. Conditions were misty, the fireman looked rather diminutive and very young, and there was a track repair slowing through Weybridge. But schedule was closely adhered to. After a gradual rise of speed to 72 m.p.h. down the tempting descent past Winchester to Eastleigh, the *Belle* was nicely to time as it slowly rounded the Northam curve over the junctions at the approach to the first stop at Southampton, 79¼ miles in 88 minutes, 85 min. nett.

After climbing from the waterside scenery to the moors and woodland of the New Forest, then attaining 60 m.p.h., adverse signals brought us almost down to walking pace at Brockenhurst. But after a lively finish, with 63 m.p.h. near Christchurch and a "rush" up Boscombe bank, the arrival at Bournemouth was only 2 minutes late.

On the New Zealand Railways. A scene at Arthur's Pass, at the Canterbury end of the Otira Tunnel. A train of coal and timber is waiting to leave for Christchurch behind 4-8-4 locomotive No. 968. Photograph by Harding Brown, New Zealand.

Taunton and Basingstoke as Traffic Centres

Though a long way apart these two important country towns have a good deal in common, and present much of interest from the railway point of view Each is on a principal main line between London and Devon, Cornwall, etc., and each has a busy main line junction not far away, with a flying junction carrying one track over two others by means of an overbridge to avoid trains delaying one another on the level. From these junctions, through the stations in both cases, there are four tracks, the two down ones being side by side, then the two up; the central island platform serving the two fast lines, one on each side.

Both places also present considerable activity as branch junctions, especially Taunton, from which within a few miles westward trains diverge to the Barnstaple and Minehead branches; not far to the east off go the Chard and Yeovil local trains. The last named can reach their destination from the direct Castle Cary-London route, or from the Bristol main line after it has diverged at Cogload Junction. A few miles east of Taunton water troughs permitting tenders to be replenished at speed are provided in all four tracks but similar facilities are not to be found on the S.R.

At busy times trains converge on Taunton in close succession to or from London, Bristol, S. Wales, the Midlands and North, Minehead, Exeter, Torquay, Penzance and elsewhere. It was fairly quiet on an ordinary afternoon when I was looking round recently on the station, which is 142¾ miles from Paddington by the shortest route. The *Cornish Riviera* and *Torbay* expresses had passed at speed; *Caerphilly Castle*, first of a famous line of 4–6–0 locomotives, arrived with a slow from the west; and there were 2–6–2Ts 5542–3 and Mogul 6377 in bay platforms providing accommodation for branch trains. Collett light pannier 0–6–0T 5423 arrived on the down main line with a local from Castle Cary; a Hall on the relief track brought part of the *Merchant Venturer* from London and Weston-super-Mare; and then came *Kidwelly Castle* with the northbound *Cornishman*, which I boarded.

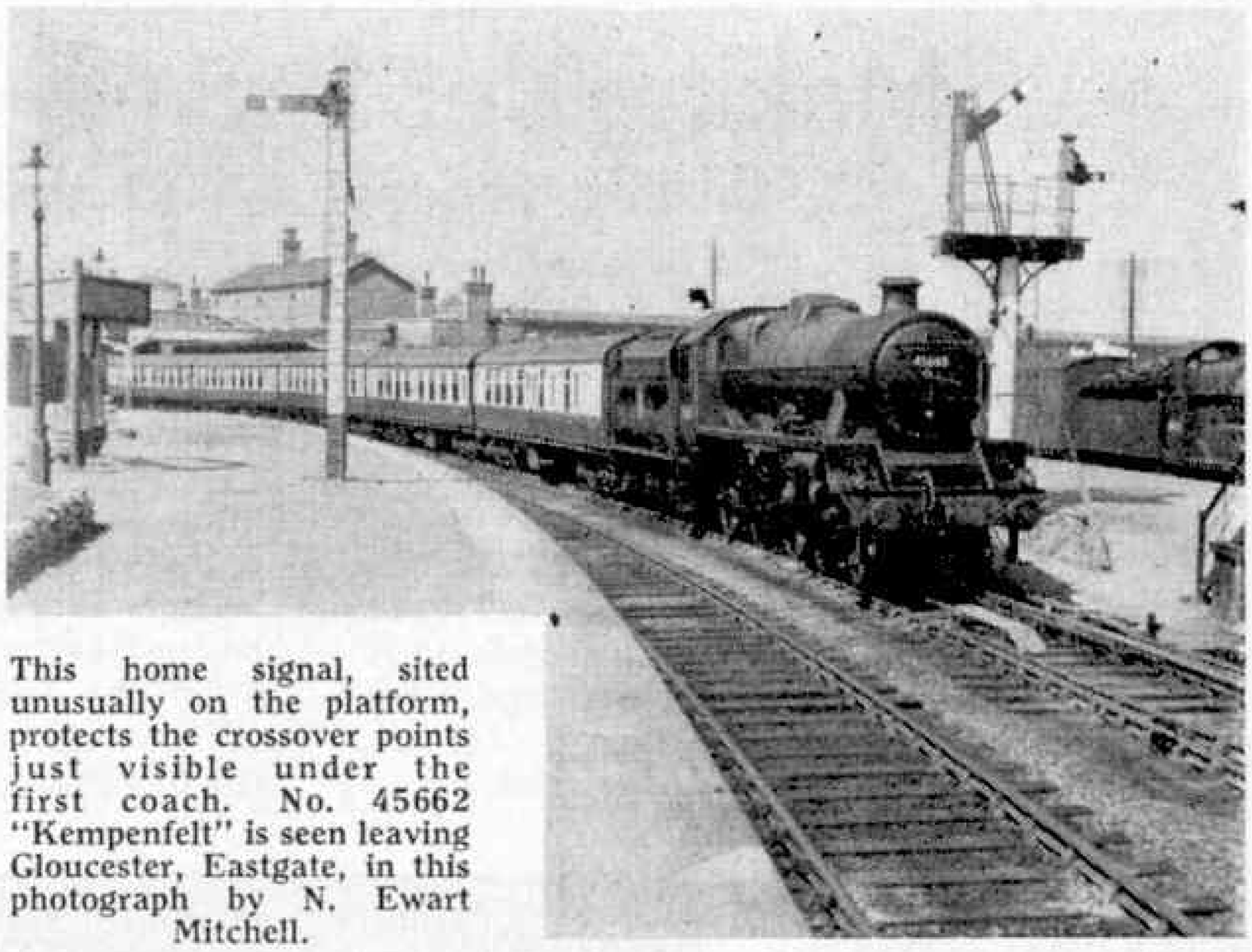
Basingstoke is 47¾ miles from Waterloo. I was there on one of the peak Saturdays last summer when in early evening additional Channel Islands boat trains from Southampton Docks were numerous. Several were hauled by S15 freight or H15 mixed traffic 4–6–0s, and one by a B.R. class 4 2–6–0. These trains were mingling with the London-bound holiday or ordinary trains from the Exeter or Bournemouth directions, converging at Worting Junction, 2½ miles west of Basingstoke. The one branch diverging at the east end to Reading is an important passenger and freight link, which was G.W.R. property. That day it was carrying through trains between Newcastle, York, Sheffield, Birkenhead, Wolverhampton, etc., and Bournemouth or Portsmouth, travelling by way of Reading West Curve and Oxford. S.R. engines regularly go that way to Oxford, and W.R. ones run through to Portsmouth

or Southampton; so locomotive variety, including a comprehensive Southern range, was quite entertaining.

I travelled up to Waterloo behind *Robert Blake* in a Weymouth express, my only run for a long while with a Lord Nelson 4–6–0.

New Locomotives Completed or Planned

Contracts have been placed with British manufacturers for the construction of 141 main line diesel locomotives, and 30 power units for others are to be built in B.R. workshops. Eleven will have diesel-hydraulic transmission, the others will be driven electrically. They will comprise three main designs, all regarded as being of a trial nature, and vary in size, type and power. Extensive tests are to be made with Sulzer (Swiss) and M.A.N. (German) diesel engines made in this country as well as with British ones.



This home signal, sited unusually on the platform, protects the crossover points just visible under the first coach. No. 45662 "Kempenfelt" is seen leaving Gloucester, Eastgate, in this photograph by N. Ewart Mitchell.

Of the more mundane 350 h.p. diesel-electric shunting 0–6–0 type now becoming familiar, additional engines lately completed included Nos. 13180–1 to 17A, Derby shed, followed by Nos. 13182–96 constructed at Derby for the Western Region, of which the first three were allocated to 82B, Bristol, St. Philip's Marsh. Nos. 13162–6 were added to stock at 34A King's Cross.

Some of the latest class 9 steam 2–10–0s have gone to the N.E.R. where Nos. 92060–4 are reported from 54B, Tyne Dock shed, others being expected.

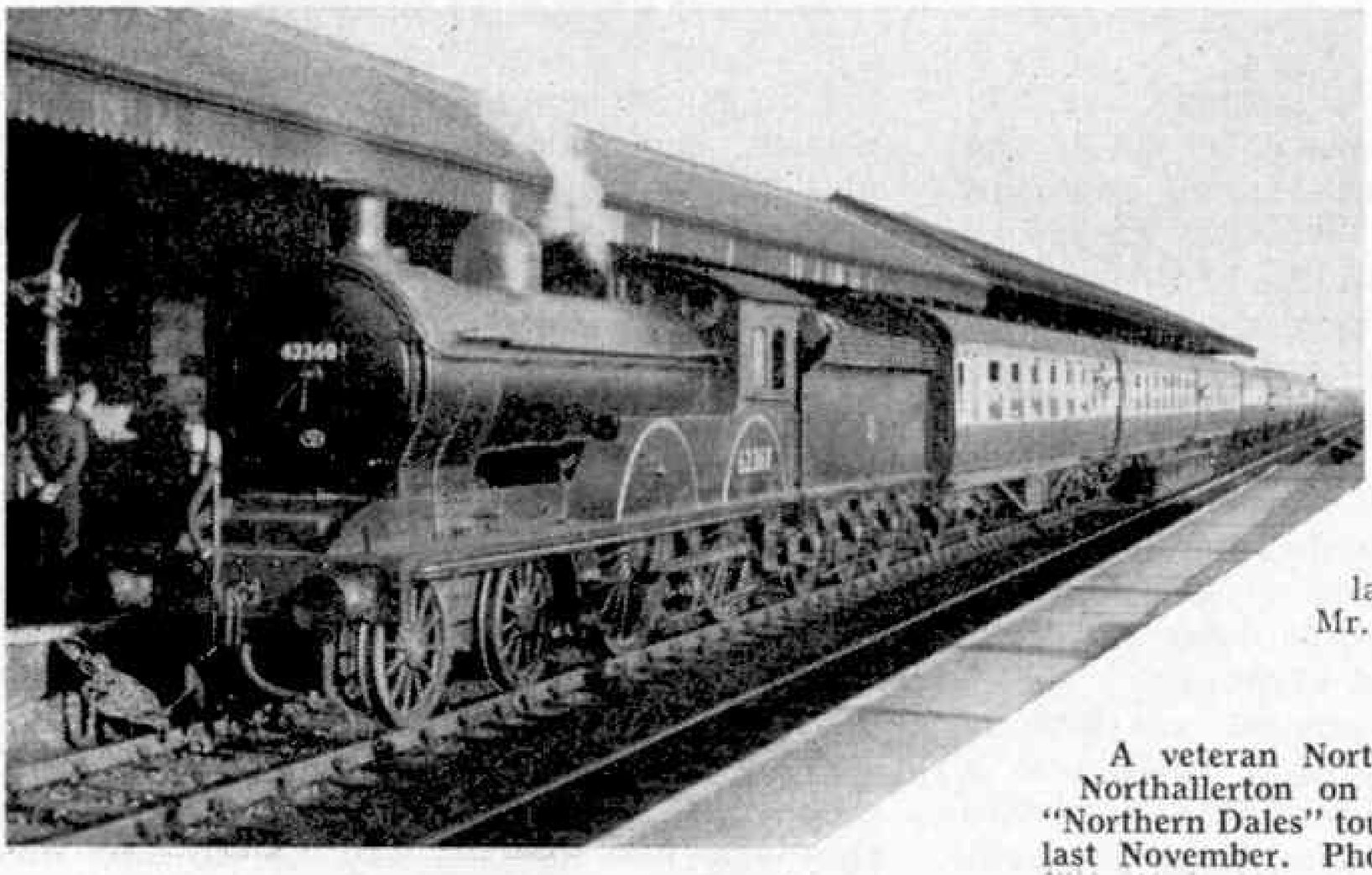
Western Tidings

No. 6015 *King Richard III* has been fitted with a double chimney enclosed in a large casing and has attained some very high speeds. Others of the class may be so equipped as part of an improvement and modernisation plan. Two of the modified 4–6–0 Halls, including *Bryn-Ivor Hall*, which commenced at No. 6959 have been observed painted in green passenger livery instead of lined black, mixed traffic, and it is believed that some of the County class are also receiving this more attractive finish.

No. 4061 *Glastonbury Abbey* one of the last Star, early 4-cylinder 4–6–0 express engines, appeared without the now standard smoke-box metal number plate but with yellow numerals painted on the buffer beam in former G.W.R. style, when hauling the Stephenson Locomotive Society's round trip Birmingham-Swindon special, and later last summer the Paddington-Shrewsbury Talyllyn Railway Preservation Society special. The latter, incidentally, was taken by a T9 S.R. 4–4–0 across Central Wales. Another Star, *Princess Margaret*, has been working in the West lately, still looking very spruce.

Peatling Hall, the first of the latest modified series, with driving wheels 6 feet in diameter, did very well on the accelerated fastest express from Oxford to Paddington, allowed exactly 60 minutes for the 63½ mile overall run, leaving the university city at 5.35 p.m. Speeds up to 72–73½ m.p.h. which are essential on so smart a timing were sustained on the level. There was a slight slack at Twyford and a severe signal check outside Paddington but the six-coach train was at rest in the terminus with about 20 seconds to spare!

A determined effort to make up time with the up *Pembroke Coast Express*, one of the fastest S. Wales-London trains was made by the Old Oak driver and fireman of *Coity Castle*, hauling a 10-coach, 355-ton load. They were stopped for six minutes on the steep climb out of the Severn Tunnel by signals and passed Swindon seven minutes late but approached Paddington nicely to time, having also taken three track repair slacks in their stride. Then, alas, another signal stop occurred, as their platform was not quite clear, making the final arrival 1¾ minutes late. The nett time from Newport, Mon., was not more than 133 min. for 133½ miles. The last two runs were logged by Mr. D. S. M. Barrie, M.B.E.



A veteran North Eastern class R 4-4-0 at Northallerton on the occasion of the special "Northern Dales" tour referred to in Railway Notes last November. Photograph by S. C. Nash.

Making Jet Engine Blades

A Casting Process 4,000 Years Old

This interesting article by P. A. Crooke, on the lost wax process of making the blades used in such aero engines as the Armstrong Siddeley Sapphire, is reproduced from the Hawker Siddeley Review by courtesy of the Editor.

IT is very doubtful if anyone would connect a sonic boom at the Farnborough Display with a visit to the local dentist or a day trip to the British Museum. Yet as the latest *Javelin* and *Hunter* fighters flash across the wide runways, experiments conducted more than 4,000 years ago have placed the pedigree stamp on certain components of the modern turbojet.

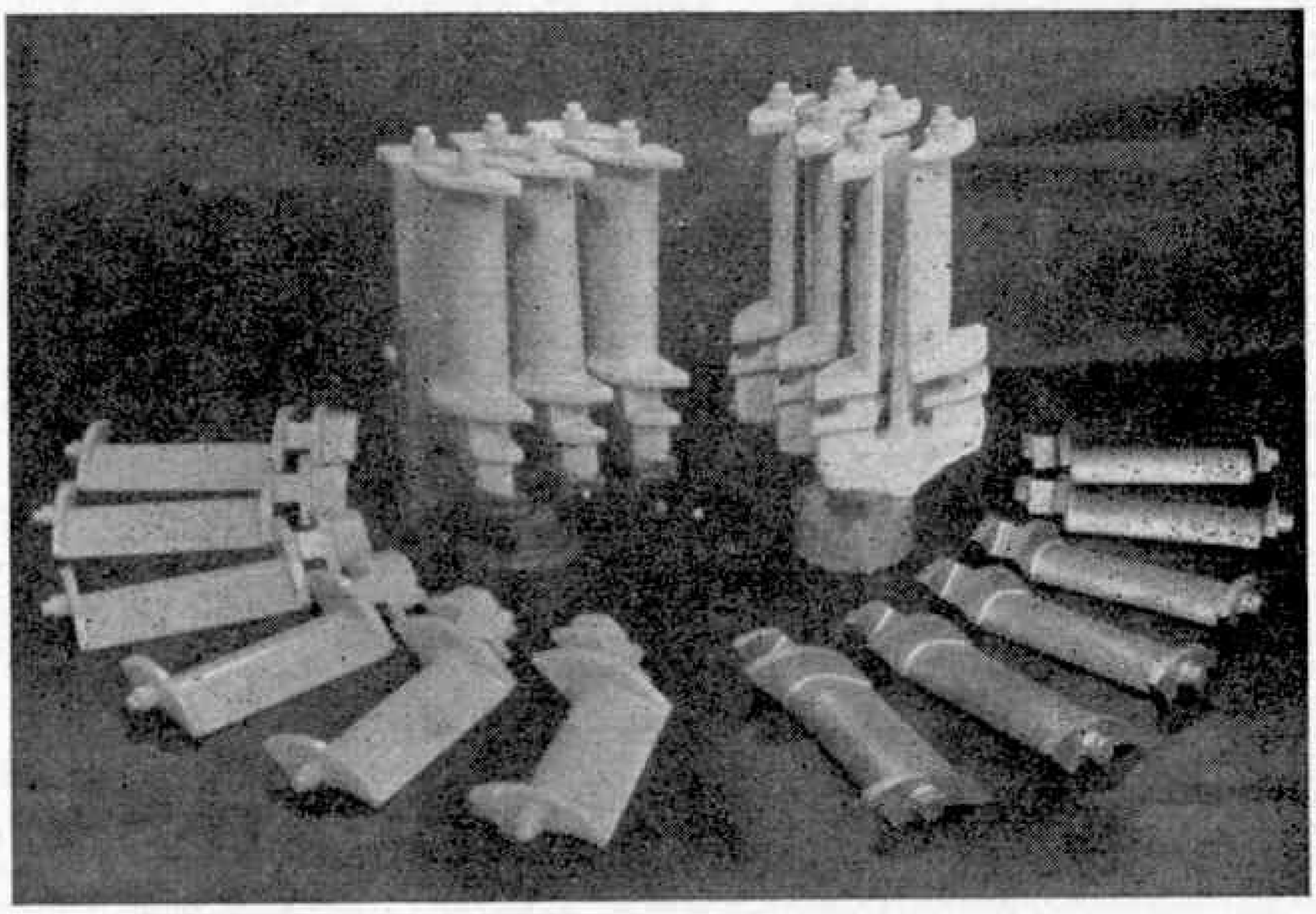
In the Armstrong Siddeley Sapphire, for instance, there are hundreds of stator blades. These blades must be extremely accurate in size and shape. They must be produced by processes that will guarantee the highest standards as well as quantity production. This is one of the important tasks allotted to the precision foundry at Hucclecote, Gloucestershire, of Brockworth Engineering Co. Ltd.

To aid them they employ what is known as the lost wax process. In this the exact pattern of a blade is made in wax. A covering of special cement-like mixture is formed closely round the wax pattern and after air-drying the whole thing is heated until the wax melts and runs away, leaving a cavity of the same shape in the middle of the mould.

Metal is then poured into the mould and after it has been allowed to cool the "cement" is broken into pieces, disclosing a metal blade of exactly the shape and size required. The process is used by Brockworth Engineering to make not only blades for a wide variety of gas turbines but also to produce other heat resistant steel components for jet engines.

The origins of the process are lost in antiquity. It is known that there was a well-established method of making intricate statues and religious ornaments in both ancient China and India as long ago as 2200 B.C., and the first mirrors made in China were probably cast in bronze from a clay mould, using a beeswax pattern.

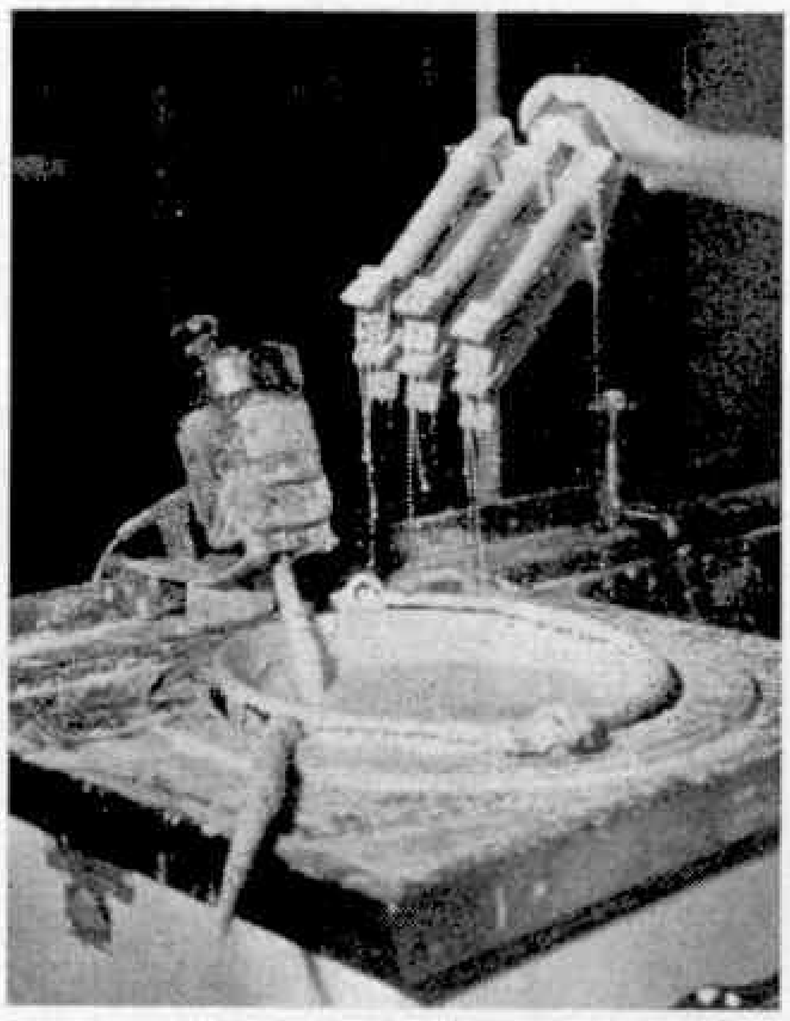
Signor Benvenuto Cellini (A.D. 1500-1571), the master sculptor of Florence, is believed to be the first "modern" adaptor of the process. For his patrons Cellini devised wonderful carvings of great beauty.



Wax patterns of turbo-jet blades. An early stage of making jet engine blades by the lost wax process, described in this article, is the assembly of the patterns in clusters, as shown in the background.

Wishing, however, to draw in greater wealth, the master sculptor hit upon the idea of making moulds and, from them, brilliant copies indistinguishable from his originals. By selling overseas, far from his patrons' eyes and ears, Cellini not only reaped a rich harvest, but also had the financial peace of mind in which to turn out even better sculptures.

When dentistry advanced to the point where patients wanted something more than immediate extraction, a search was made for a method of crowning the root of a broken or decayed tooth. Eventually the lost wax process was tried. A piece of wax was moulded into the shape required and covered with a plaster-like material. When the wax was melted the mould left was



The clusters are placed on a base plate and dipped into a fine binding agent, as seen on the right, before mould cans are placed around them, as shown below.

filled with molten gold and the resulting casting cemented to the stump of the patient's tooth.

While the aircraft industry owes a debt to the Chinese, Signor Cellini and the dentists, tribute is also due to the jewellers. For while the dentists required only one "lost wax" casting for each tooth, the manufacturing jewellery trade required many castings.

Each year the jewellers produce new designs for rings, brooches, and so on. They have to send out quantities of samples for approval. To overcome the costly business of sinking dies before production, they adapted the "lost wax" process to good effect. Identical patterns were produced by pouring molten wax under pressure into vulcanised rubber moulds made by sandwiching a master ring between two pieces of raw rubber and vulcanising them together. Dimensional accuracy was not required, but the surface finish and reproduction of the finely worked detail design was excellently reproduced in quantity.

To produce blades for jet engines is one thing, but to find the right alloys to withstand the tremendous thermal variations experienced is quite another, as the then Squadron Leader Frank Whittle learned when he made his initial turbine experiments before the war. And this is where dentistry again comes into the picture. In about 1930 dental technicians evolved a stainless steel bridgework for artificial teeth that withstood the corrosive acids in the mouth and could be cast easily. It was called Vitallium.

Early in the last war an American aero-engine manufacturer wanted tens of thousands of blades for an exhaust-driven turbo-supercharger. The alloy chosen was, at that time, considered almost unmachinable; in fact, under the name Stellite, it was used for tipping cutting tools. The makers of this Stellite alloy were quick to point out that the material Vitallium, which was almost identical, was being precision cast. In a very short time plant was laid down and no fewer than 25 million blades were cast by one company alone in four years. The Ministry of Supply became interested in the process and brought it to this country. With variations it was adopted by a number of British companies and is now firmly established as an essential link in the chain of manufacture in the aircraft industry.

In precision casting at Brockworth the first step always is to produce a metal master pattern of the same shape as the casting required, but with a small shrinkage

Semi-fluid cement is then poured into the mould. When it is set the wax is melted out.

allowance on all dimensions. From the master model a die is cast in a metal that has the property of neither expanding nor contracting when it solidifies. In effect this means that the die cavity will be identical in size to the master model. After this has been suitably polished molten wax is injected under pressure into the die—thus reproducing the exact shape of the die cavity. This pressure sequence is performed on semi-automatic machines, so that all the operator has to do is to open and close the die and eventually to remove the wax pattern.

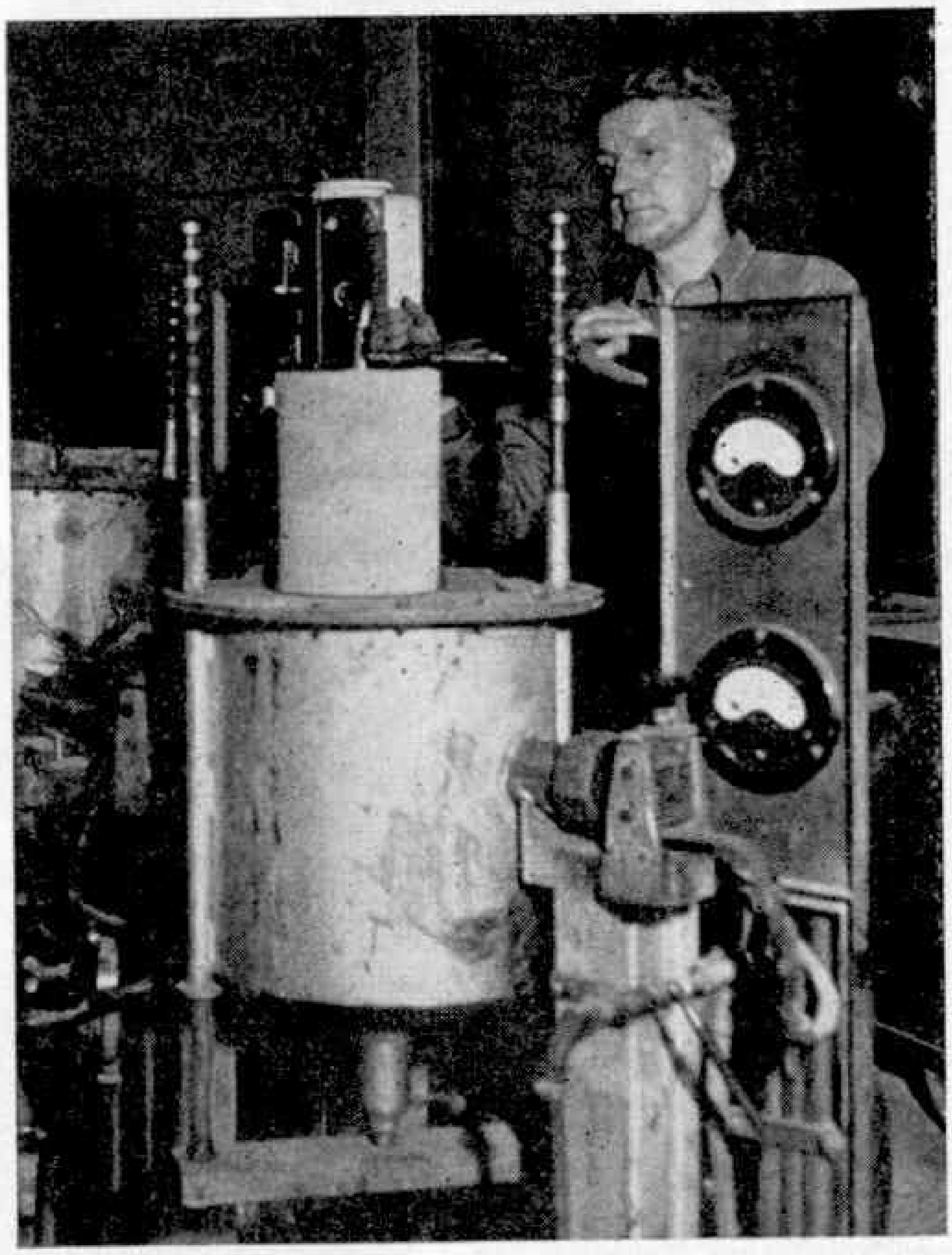
Having got to this stage, and after proper examination, the patterns are assembled into convenient clusters. To reproduce the smooth surface of the wax pattern in the finished casting when using a high temperature steel calls for the most careful choice of refractory and control of its application. The chosen material is very finely ground up and made into a slurry—a semi-fluid mixture—with binding agents, and the wax cluster is dipped into it or it is sprayed on. When dry, the coating is quite hard and adheres firmly to the wax.

The next operation is to make a watertight mould case around the wax cluster to receive a coarser mixture. This is actually an air drying compound, strong enough to hold its shape during the baking and casting operations but porous enough to permit air to escape as the metal is poured in.

The next stage is to place the mould case on a vibrating table, in order to pack the solid particles of refractory round the wax cluster and bring air bubbles and surplus liquid to the top of the mould. After setting overnight, the moulds are passed through a low temperature oven. This serves to melt out the wax, which is drained away and recovered—the whole being termed the "lost wax" process. It may be said that the process should be called "wax regained"—but the wax which is collected is only used again for making the frames for the clusters and never for new blade patterns.

The dry moulds are then baked by even stages, to a temperature of approximately 1,000 degrees Centigrade. In this process the baking burns out any remaining wax and permits the molten metal to run easily into the furthermost cavities. At the same time, the refractory mould is subject to expansion, which in turn to some extent compensates for any slight shrinkage of the metal when it solidifies, thus contributing to the accuracy of the final casting.

When it is at the right temperature the mould is taken out of the furnace and clamped mouth to mouth on top of a small arc furnace which holds 12 lb. of molten metal. The furnace and the mould are then inverted so that the molten metal runs freely into the mould cavity, the process on occasions being assisted by a low air pressure after the metal has run into the mould. When cold, the moulds are broken up and the castings are removed ready for the fettling operations prior to a very stringent final inspection. This includes X-ray photography of every individual blade, to reveal even the smallest internal flaws.



The mould is clamped on top of an arc furnace, and the whole arrangement is inverted, so that molten metal pours into the mould to form the blade.

Signor Cellini, craftsmen of China and India many centuries before his birth, jewellers, and numbers of unknown dentists in recent times—all have played their parts. A far, far cry indeed from the flashing speed of the jet aircraft of today. Yet the link is there—more than 4,000 years of pedigree.

BOOKS TO READ

Here we review books of interest and of use to readers of the M.M. With certain exceptions, which will be indicated, these should be ordered through a bookseller.

"THE LOCOSPOTTER'S SPECIAL No. 2"

By G. Freeman Allen (Ian Allan, 5/-)

As might be expected, the accent in this book is on locomotives, but not steam ones only, because due attention is given to the B.R. Modernisation Plan with its impending dieselisation and electrification. In addition there is brief mention, with photographs, of the type of French locomotive that reached the worlds' record railway speed of 205 m.p.h. early last year. An account of a ride on the footplate of the *Elizabethan* is in striking contrast to the description of the amenities of passenger travel in a modern American streamliner given in another section, and a chapter on railways in the snow provides a topical winter note.

By current standards the book is very good value for its modest price.

"THE PICTURE HISTORY OF FLIGHT"

By John W. R. Taylor
(Hulton Press, 25/-)

This fascinating book by our regular aviation contributor, tells in mainly pictorial form the whole story of Man's conquest of the air, from the early references of the 13th century scientist-monk Roger Bacon to present-day preparatory work on inter-planetary flight.

In the volume there are almost 650 half-tone illustrations, arranged chronologically and grouped in chapters each preceded by a page or two of text summarising the progress of aviation during the period concerned. Generous captions further help to make the story complete. A comparison of the illustrations of those strange contraptions that preceded the first successful powered flight by a heavier-than-air machine with the jet-propelled, rocket-assisted aircraft of today conveys more eloquently than any amount of text the amazing progress achieved in little over half a century of aeronautical research.

"THE TRAMWAYS OF PAISLEY AND DISTRICT, 1885 - 1954"

By Ian M. Coonie and Robert R. Clark
(The Scottish Tramway Museum Society, 2/6)

The Scottish Tramway Museum Society was formed in 1951 with the object of securing representatives of rolling stock and other tramway equipment for preservation and the eventual establishment of a permanent museum. The Society also hope to have a stretch of track available on which some at least of their vehicles will be able to make short runs. Three tramcars are already in process of acquisition, and all are of historic interest.

To commemorate the Golden Jubilee of electric tramways in Paisley, which was celebrated in 1954, the Society have published a 24-page booklet on the history of the system from the earliest days of operation by horses. Those interested in tramway history can obtain copies from the Hon. Secretary-Treasurer, I. L. Cormack, M.A., Largo, 80 Camp Road, Baillieston, Glasgow, price 2/9, including postage.

"SUPERSONIC AIRCRAFT"

By Roy Cross (Macdonald, 6/6)

This timely and informative book will be welcomed by readers who want to learn just what has been accomplished so far in the design and production of aircraft capable of flying faster than sound, and who wish to familiarise themselves with the varied types of such machines produced to date. It also indicates the lines along which design and research staffs are working to develop their idea of a perfect supersonic aircraft.

Such mysterious terms as Mach numbers, sonic bangs, expansion waves and transonic speed are explained in a chapter on the aerodynamics of flight at and above the speed of sound. This leads logically to a description of the steps taken to protect the pilot of a jet aircraft flying at, say, 35,000 feet. Chief among the problems involved is lack of oxygen in the air at such heights.

Some of the highlights in the as yet brief history of supersonic flight are listed, and there is a survey of the range of supersonic aircraft of Great Britain, U.S.A. and France. Finally, the formidable problem of heating by friction and other causes of aircraft flying at very great speeds is discussed, and we learn of the introduction of new and better heat-resisting materials in the construction of supersonic aircraft.

The wealth of information crowded into the 60 or so pages of this book is supplemented by excellent coloured and half-tone illustrations and coloured line drawings.

"THE LOCOMOTIVES OF THE GREAT EASTERN RAILWAY"

By C. Langley Aldrich, price 15/-

Here is the sixth edition of what is obviously a popular book. Enlargement and improvement have been the rule in each successive edition from the first, which appeared during 1943. Although it will specially appeal to those who remember the Great Eastern Railway, it is a mine of information for those latter-day enthusiasts who wish to acquire knowledge of the engines of that line.

The story does not end in 1923, when the Great Eastern Railway as such disappeared, but continues to 1954. Withdrawals are correct to the end of June 1955. Some of the illustrations are familiar, as they are bound to become in the course of time, but all are well reproduced.

Copies of the book are obtainable from C. Langley Aldrich, 6 Margarite Way, Wickford, Essex, price 15/8 including postage.

"AIRCRAFT TODAY"

Edited by John W. R. Taylor
(Ian Allan, 9/6)

This annual collection of articles on every aspect of aviation, written by experts, claims to be the only book of its kind in the world.

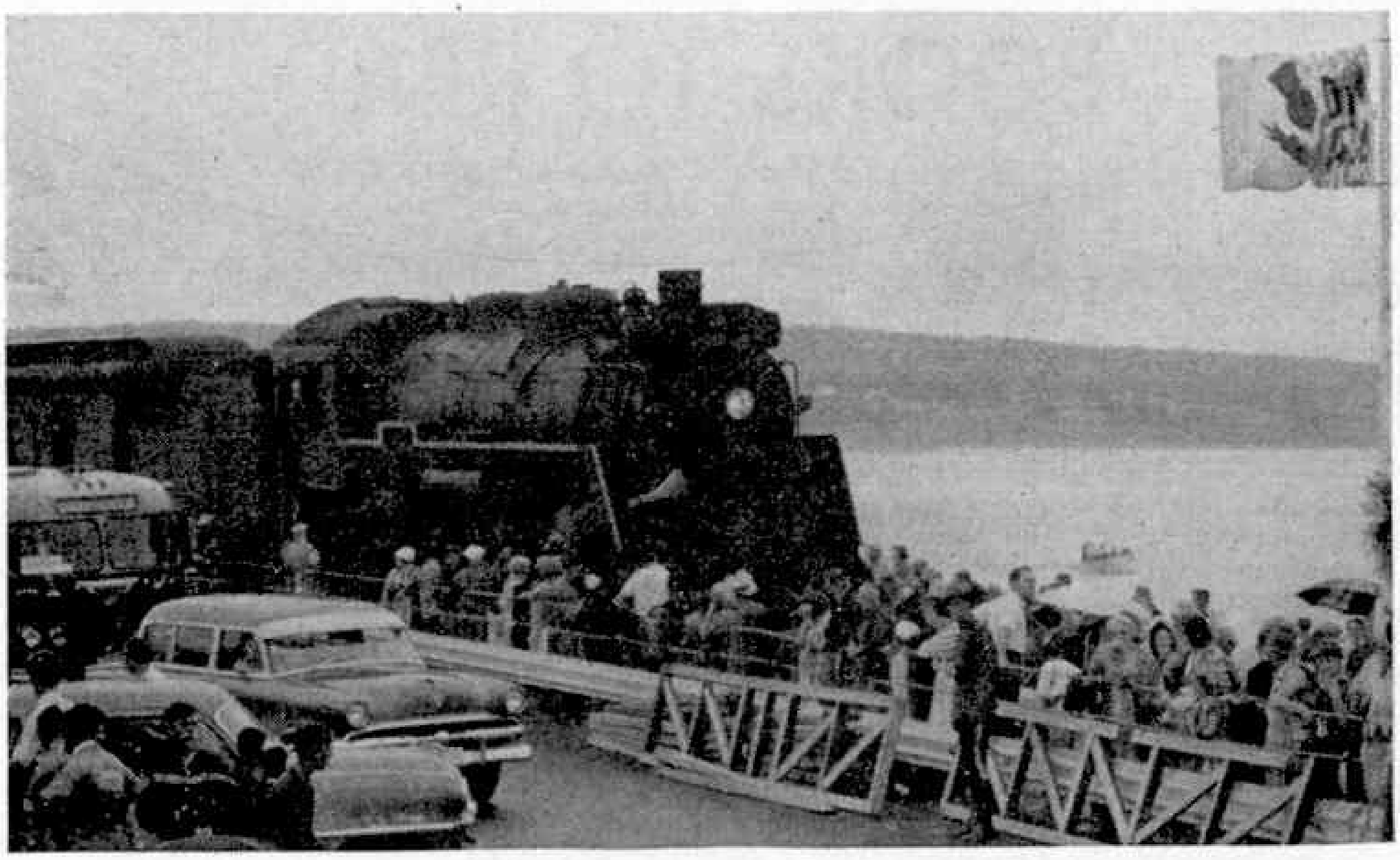
The present volume follows the usual pattern of this work, beginning with Mr. Taylor's excellent summary of world aviation developments during the twelve months since the 1955 edition of this book. Among the subjects dealt with by other contributors are Russian aircraft, the new London Airport, test flying, the story of Air France, and the future of military air transport.

There are over 100 fine photographs and drawings, and a specially interesting chapter on Royal Air Force Squadron Insignia is illustrated with four pages in colour of squadron markings.

"THE OBSERVER'S BOOK OF RAILWAY LOCOMOTIVES OF BRITAIN"

By E. F. Carter
(Frederick Warne, 5/-)

It is difficult to be as enthusiastic as one would like over this handbook, which is primarily intended for pocket use to help the observer to recognise locomotives seen in the course of his travels. The book is compact, it is true, and it does contain a great deal of useful information conveniently arranged, but it seems to have suffered from compression and perhaps haste in preparation. There are plenty of illustrations, including a number in colour.



The Canso Causeway

A Great Canadian Man-made Isthmus

By A. J. Branston

THE CANSO CAUSEWAY, officially opened in August of last year by Canada's Transport Minister George C. Marler, is claimed to be not only the world's deepest man-made isthmus but also one of its longest. It links the island of Cape Breton to Canada's mainland of Nova Scotia.

Though the Strait of Canso, between Cape Breton Island and the mainland, is but a mere strip of water, its very existence has long been a formidable barrier to the natural flow of commerce between Cape Breton Island and the rest of Canada. To begin with, the barrier was lowered a little by using ferry services. But the rapid expansion of traffic, reaching in 1954 about 50,000 cars and 113,000 railway wagons a year, made a new solution vital.

A Canadian National Railways train from Sydney, in Cape Breton Island, rolls across the Canso Causeway, which now unites the Island with the mainland of Nova Scotia, as crowds gather for the opening ceremony of the Causeway.

The problem had indeed been exercising the brains of engineers and other people for something like 50 years, especially people living on Cape Breton Island. Clearly there were only three possibilities—a bridge, a causeway or a tunnel. The engineering difficulties as well as the cost of each project were carefully considered.

At first, a bridge was favoured, and plans of one costing about £5,000,000 were drawn up. But in the end this idea was abandoned, because engineers believed it would not be able to withstand the Strait's powerful tides and ice jams. The problem of "conflicting" tides was indeed a major one. At Chebucto Bay, which is at the south end of the Strait, the times of high and low tides are between one and two hours earlier than those at George Bay, to the north. The heights of the tides differ, with the result that strong currents running at from 4 to 6 knots are initiated in alternating directions inside the Strait.

What, pondered the engineers, would happen to all this tidal water if a causeway were built across the strait? The answer was given by George Gilbert, Q.C., of Bathurst, New Brunswick, who had given considerable thought to the question.

"The stopping of this overflowing tidal rush," he pointed out, "will cause water and ice to pile up in much greater than normal depths around Prince Edward Island, along the northern shore of Nova Scotia and on the south-eastern coast of

New Brunswick. This build-up could result in tremendous damage to these coastal areas."

It was considered, also, that to shut off the warming flow of water from the Gulf of St. Lawrence through the Strait to the sea would cause a longer annual ice period than at present within that area, thereby endangering local shipping traffic and damaging the fishing industry.

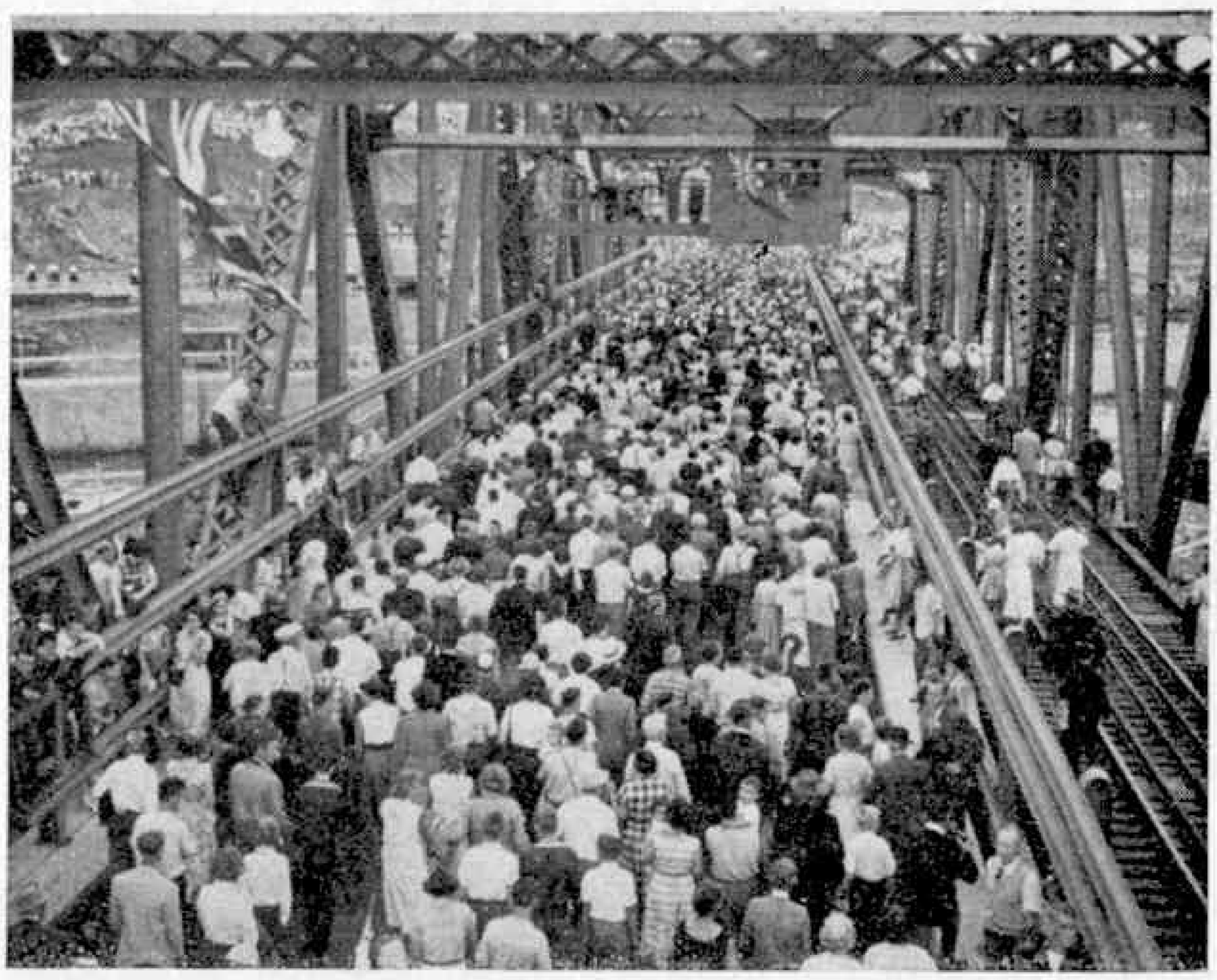
These objections to a causeway, all based on local knowledge and sound reasoning, were backed up by the opinions of some engineers. Examination of the alternative project—a tunnel—soon showed that this would be excessively costly to build, though some local opinion thought it might be the wiser investment in the long run.

Despite the objections, it was finally decided to build a causeway, of such solid strength as to be capable of withstanding any possible damage from tides, ice or weather. The project was officially announced in October 1951, and work on the rockfill commenced in September 1952.

It was a formidable engineering project. Four phases were initiated. The first was the construction of a 14-mile diversion of the Canadian National Railways mainland line from Linwood to the southwest side of the Strait, together with other works that included the construction of a new station. The second was the building of a navigation lock with gates, swing bridge and breakwater at Balache Point, on the Island side of the Strait, to provide a through waterway. The highways also had to be relocated on both sides of the Straits, with elaborately planned approaches and railway crossings, and a rockfill causeway had to be constructed. Work on all four phases was carried on simultaneously.

The rockfill was completed in December, 1954. This work was faced with many difficulties that tended to slow up progress. For instance, to complete the fill over 10,000,000 tons of granite rock were needed. This was obtained from nearby Cape Porcupine, on the mainland. The rock was drilled and blasted, and the stone was loaded on to huge 40-ton trucks by electric-powered shovels. Each load was transported to the edge of the fill and there "dumped" scientifically and carefully bulldozed into the water.

At last the job was done, and the initial test runs were made. In all, the Canso Causeway is 4,500 feet long, 80 feet wide and 217 feet deep in mid-stream, and rises 20 feet above the water line. Its base widens out gradually to 800 feet. Shipping can pass by using the canal formed at Balache Point, the navigation lock of which is 820 feet long, 80 feet wide and 32 feet deep. The lock is spanned by a swing bridge. Along the Causeway's 80-ft. wide surface is a single track railway, a roadway built to trans-Canada highway standards, and a six-foot pavement.

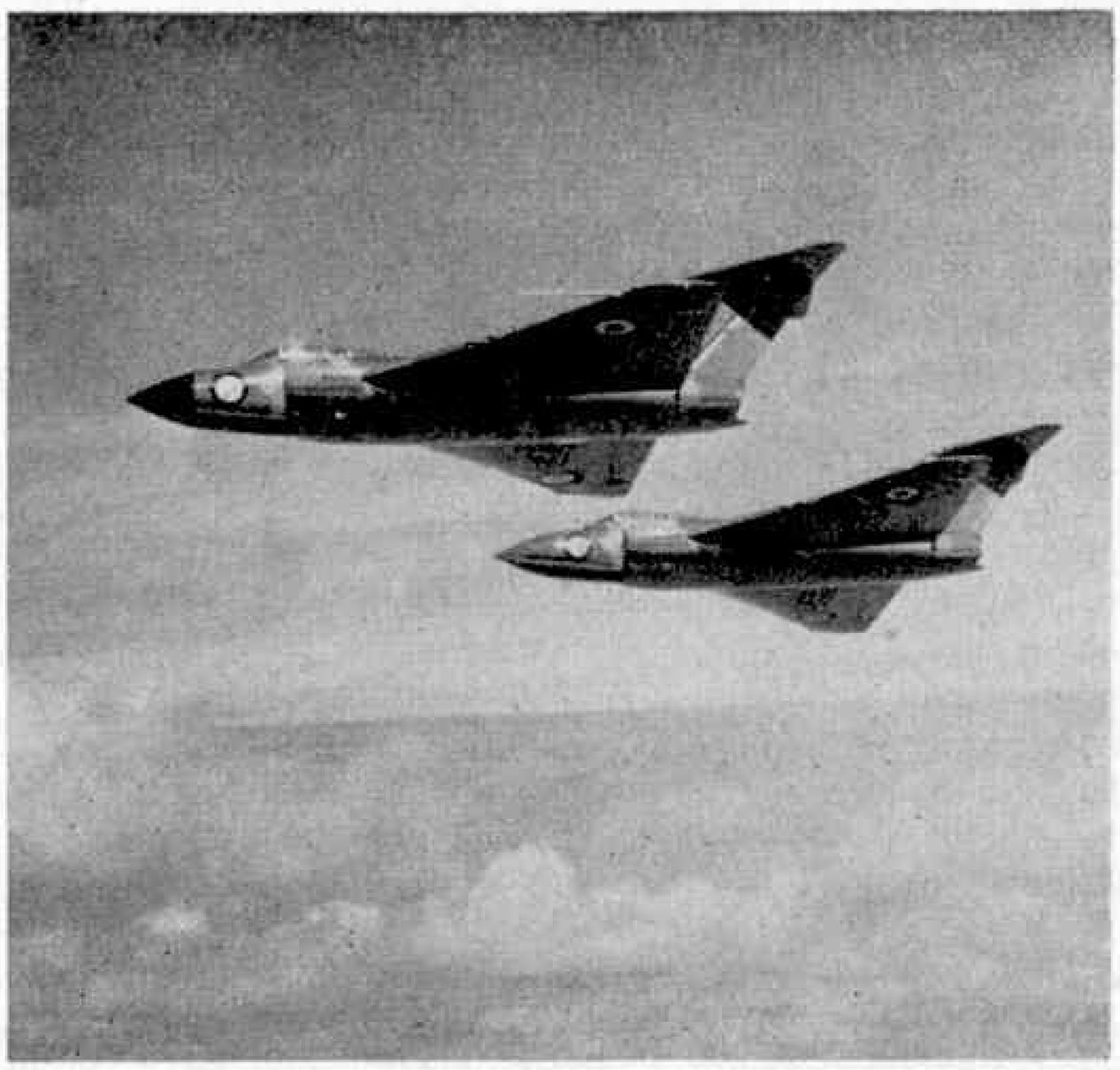


The "March to the Isles." Crowds passing over the swing bridge that forms part of the crossing between Nova Scotia and Cape Breton Island.

Though it has cost a great deal—about £7,000,000—and will require over £400,000 a year to operate and maintain, the Canso Causeway will undoubtedly prove a worthwhile investment, not only to the country as a whole but also—and especially—to the people living in the immediate neighbourhood. Sydney's huge coal and steel industry will gain enormously from the improved transport facilities, which will raise the standard of living for the people of Cape Breton Island.

Air News

By John W. R. Taylor



These Gloster Javelins for R.A.F. Fighter Command have a sharply-pointed cone over the radar scanner in the nose.

Sharp-Pointed Javelins

The Gloster Javelin two-seat, all weather interceptors now entering squadron service with R.A.F. Fighter Command look particularly well-named because, as shown in the accompanying photograph, they have a new sharply-pointed cone over the radar search scanner in their nose.

Several different versions of the Javelin have already been produced, including the FAW.Mk.1, FAW.Mk.2, FAW.Mk.4 and FAW.Mk.7. Improvements on the later Marks include the introduction of more powerful types of Sapphire turbojet and a one-piece "slab" tailplane for better control at very high speeds.

Polar Flights Doubled

Canadian Pacific Air Lines plan to increase their services between Europe and Australia, via the Polar route, to two flights each week in April. This doubling of the frequency over the 13,500-mile route, linking Amsterdam, Vancouver and Sydney, is being made possible by the delivery of two additional Douglas DC–6B air liners.

If the company can get two more DC–6Bs quickly enough, to bring its fleet to six, a third weekly service will be started in the summer. There is little doubt that it would be well booked, because large numbers of people are expected to fly from Europe to Australia to attend the Olympic Games in Melbourne.

Three-Nation Air Liner

News that Bristol Aircraft, Convair and Canadair are working together on a turboprop air liner, developed from the Britannia, gives yet another example of ever-growing British-American co-operation. Few details of the new aircraft are yet available, except that it will have thinner wings than the Britannia, four Bristol BE25 turboprops and a cruising speed of 500 m.p.h. This is some 50–75 m.p.h. less than the Boeing 707 and Douglas DC–8 jet-liners, but will be offset by the fact that the aircraft will be able to operate non-stop transatlantic services throughout the year with a full payload *and* be equally economical over shorter ranges.

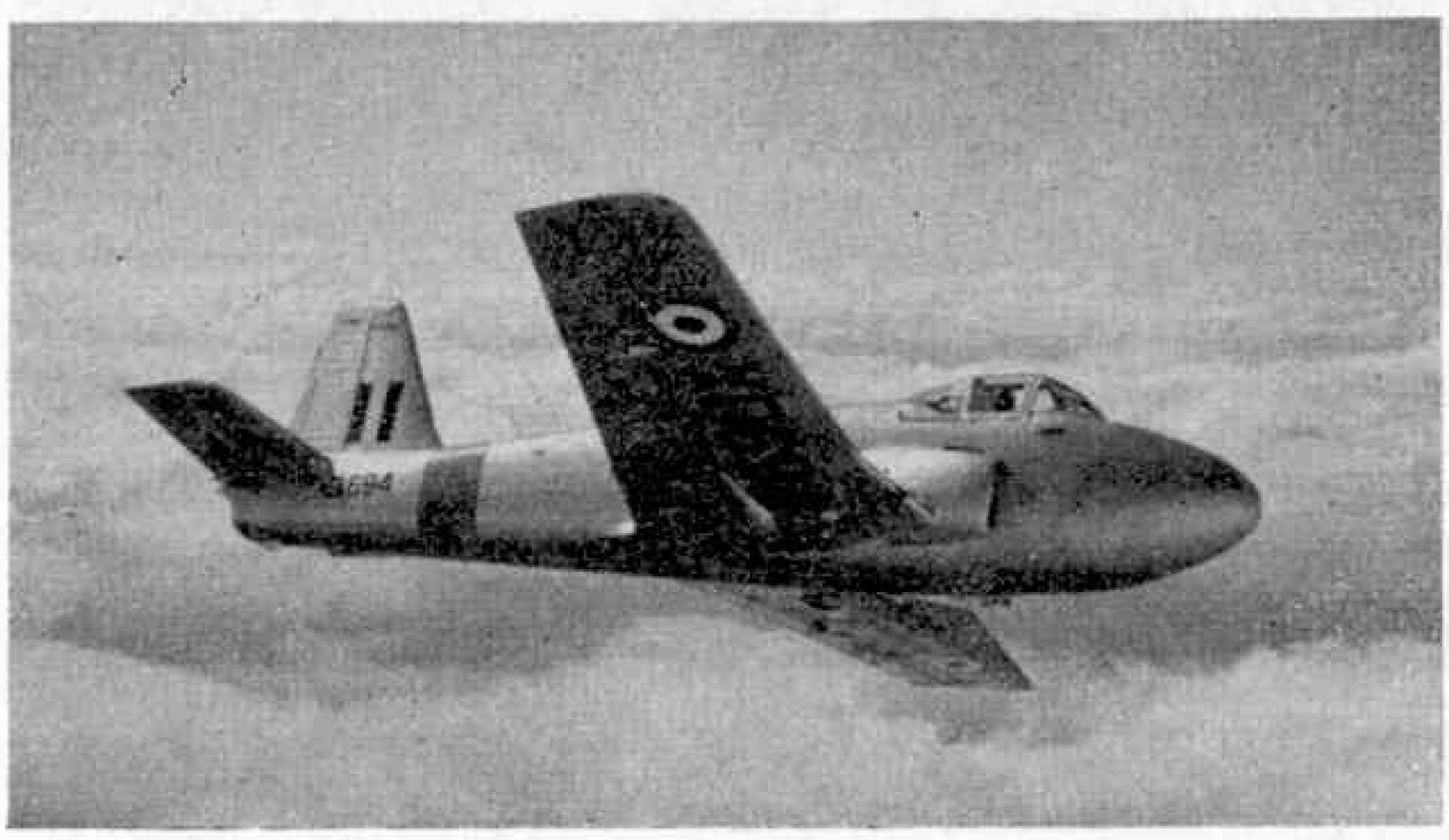
Initial design work on the air liner is being done by a combined engineering group from the three companies, at Convair's San Diego, California, factory. Later, the airframes and engines will be built on both sides of the Atlantic; and it is expected that the air liner will be merely the first of several aircraft developed by this powerful new design-production group.

Jet Training Success

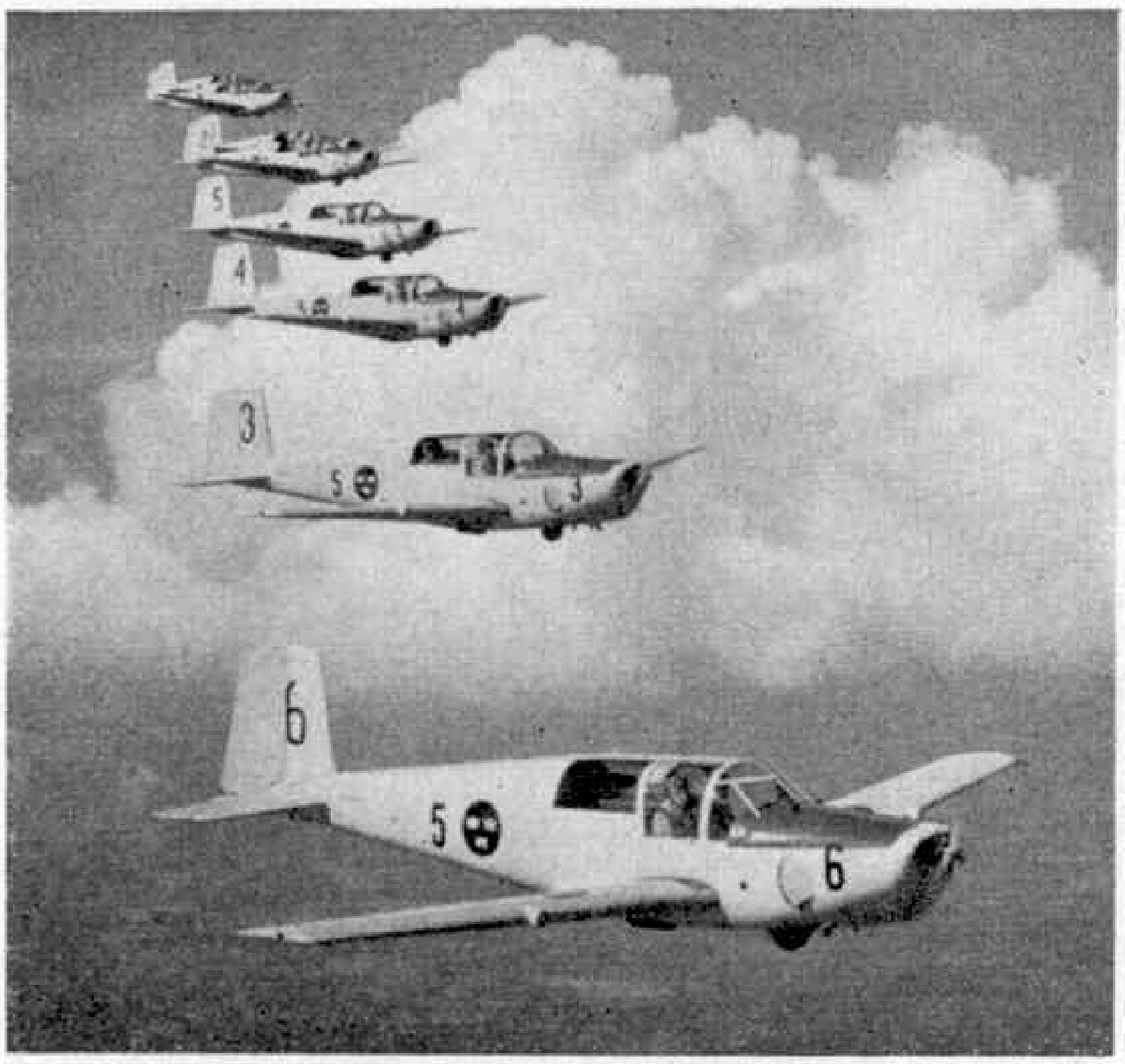
All 18 of the R.A.F. cadets who began their flying training on Hunting Percival Jet Provosts at Hullavington on 21st September last completed their first solo within little more than a month. It is rare for an entire class of pupils to reach successfully this stage of training, and will be good news for those who believe that a modern fighter or bomber pilot should fly jets from the very start of his instruction, despite the complications of, for example, a retractable undercarriage and top speed of over 300 m.p.h.

This initial batch of "all-jet" pupils was not specially selected in any way, and 12 of them had no previous flying experience. Cadet T. Foster, who flew solo on 17th October after only 8 hr. 20 min. dual instruction, became the first person in the British Commonwealth to fly solo in a jet without having first flown piston-engined aircraft. The average dual instruction required by the 18 pupils was 10 hr. 35 min.

The Jet Provost, which has a 1,750 lb. thrust Viper turbojet, is being evaluated by the R.A.F. If it proves completely successful, it will probably replace the piston-engined Provosts now in service.



Features of the latest version of the side-by-side two-seat Jet Provost, the T.Mark 2, are a much shorter undercarriage and flatter undersurface to the rear fuselage. Photograph by courtesy of Hunting Percival Aircraft Ltd.



Formation practice by SAAB-91B Safir three-seat training aircraft of the Royal Swedish Air Force. Note the semi-retractable nose wheel which enables the aircraft to make a safe belly landing, with its main wheels retracted, in an emergency. Photograph by courtesy of SAAB, Linköping, Sweden.

Famous Lancaster for "Museum"

One of the most famous Lancasters of the Royal Air Force—serial number R5868—is being preserved at a Maintenance Unit in the west country, together with eight more British, ten German, one Italian and two Japanese aircraft of the two world wars. Although not on permanent view to the public, they will be assembled and displayed in different parts of the country from time to time, during Battle of Britain weeks and on other occasions.

Lancaster R5868 flew 137 wartime sorties with Bomber Command, which is probably the highest total achieved by any heavy bomber. It began life as *Q for Queenie* of No. 83 Squadron at Scampton, Lincs., in the summer of 1942 and, after many exciting adventures, flew its last raid on 23rd April, 1945, as *S for Sugar* of No. 467 Squadron, Royal Australian Air Force. A note in the Squadron's war diary records that "In this kite the pilot and navigator go to sleep coming home, for it knows its own way back from almost any target."

Flying Submarine

The All American Engineering Company of Wilmington, Delaware, have designed a flying submarine which seems to have come straight out of a Jules Verne story. In operation, it would land as a jet-plane on a pair of hydro-skis and skim the water until it lost speed. Then its engine would be stopped, its air intakes and exhaust sealed and the cabin pressurisation turned on. After which, the flying submarine would submerge by flooding its ballast tanks. Under water, it would be driven by a marine engine and propeller, but would be manœuvred by its ordinary aircraft control surfaces.

That the flying submarine is no crackpot idea is proved by the fact that some of America's leading designers, including John Northrop, are working on similar projects.

Viscount News

Jet-age comfort and speed came to the Caribbean area on 2nd December, when British West Indian Airways began operating their first Viscount on a twice-weekly service between Trinidad, Barbados and San Juan, Puerto Rico. On 1st January, the route was extended to Bermuda and New York.

That was only a start. On 15-16th December, B.W.I.A. introduced Viscounts on to their Trinidad-Caracas (Venezuela)—Kingston (Jamaica)—Montego Bay—Nassau (Bahamas) service, and they are also helping to earn many thousands of dollars for Britain by operating three times a day on the 50-min. "millionaire holiday" route between Nassau and Miami, Florida.

In the United States another airline have chosen the Viscount as the type with which to increase their fleet. Continental Airlines have ordered twelve Viscount 810–D aircraft, delivery of which will begin in March, 1958, and be completed by September of that year. The sterling value of the order including aircraft, spares and ground equipment is almost £6,500,000.

Sabena Order More Helicopters

As a result of the success of their international helicopter passenger services, which had carried 50,282 passengers by mid-November, 1955, the Belgian airline Sabena have decided to buy eight of the new Sikorsky S–58 helicopters. The first will be delivered this spring.

The civil version of the S–58 is almost identical with the military versions used by the U.S. Navy as the HSS–1, by the U.S. Marines as the HUS–1 and by the U.S. Army as the H–34. It is about 50 per cent. larger than the well-known S–55, of which Sabena have a fleet of six, and carries more than double the payload of the smaller aircraft. In airline form, it accommodates 12 passengers, with baggage, and cruises at 112 m.p.h.

Sikorsky H.34 of the U.S. Army, similar to the civil S.58 helicopters ordered by the Belgian airline Sabena.

Swiss School for Woodcarvers

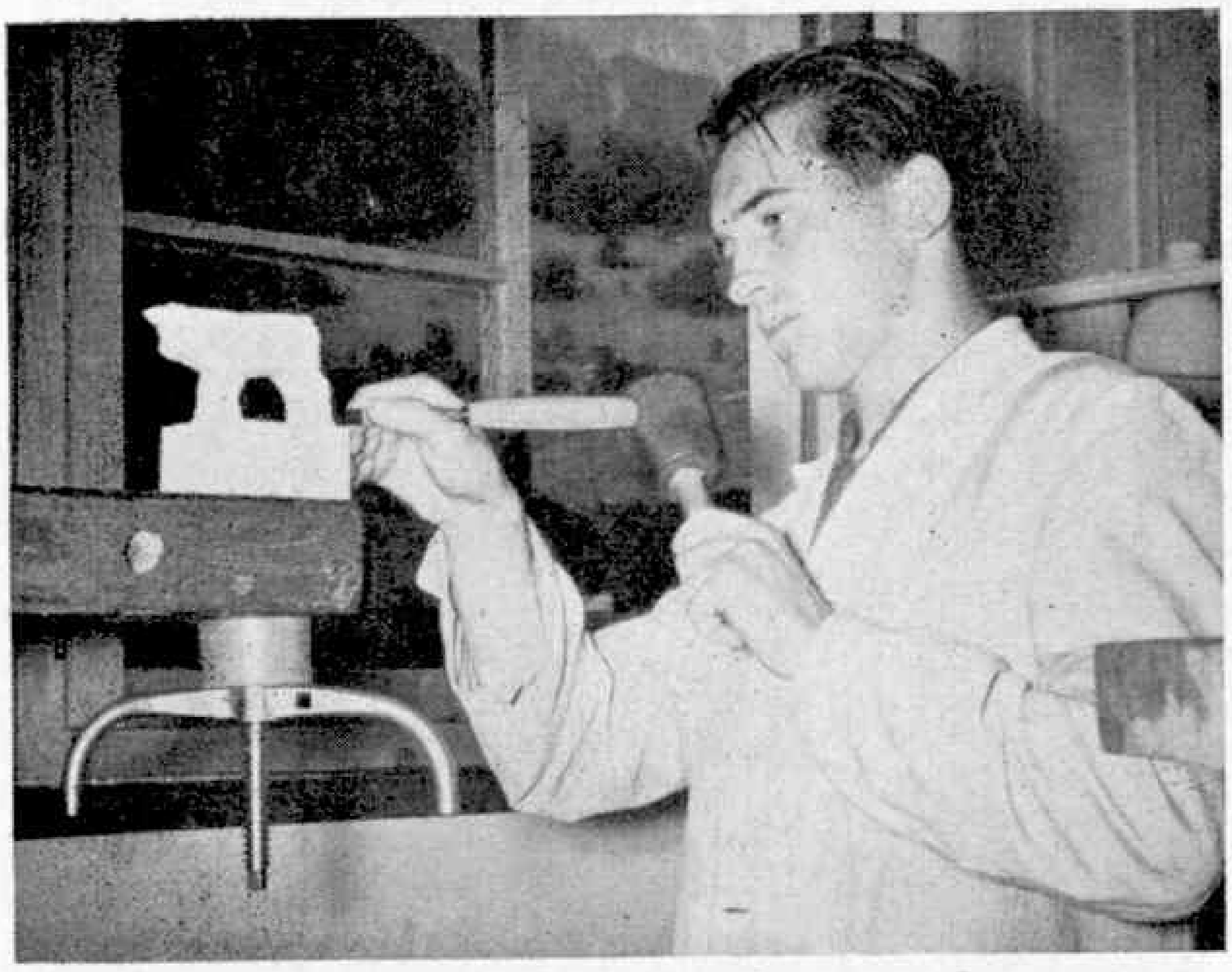
By Frank Bunce

IN the tiny village of Brienz, in Central Switzerland, there is a unique school known locally as the *School for Woodcarvers*. There young pupils, both male and female, learn to use the essential tools of this exacting craft, and later, when they are sufficiently proficient, they are taught the rudiments of simple woodcarving. Eventually, pupils graduate to making such things as tiny models of Swiss chalets that are suitable for the souvenir or tourist markets. There are two other classes, and these concentrate mainly upon producing ornaments and figure studies.

Recent years have shown that if this craft is to survive, in these difficult modern times, then new and formerly unthought of articles will have to be produced. With these thoughts in mind, many skilled workers who have left the school, and have opened their own businesses, have branched out and are now making trade signs and pictorial signposts for local authorities.

Really first class craftsmen are often given tasks that at first might be thought almost impossible. For instance, in the School's museum there are large scale models of various insects, featuring the most minute details. One model in particular is over four feet in length.

There is rich humour in this fine pictorial signpost, carved in wood. The little man is striding out with great vigour and determination to show the way to the Axalp.



A tiny figure of a calf takes shape at the hands of the woodcarver in Brienz, in Central Switzerland.

As an organised business, the craft of woodcarving was not really started until the early 19th century. It all began through the skill of a poor cowherd's son named Christian Fischer, who made pipes out of boxwood and horn and sold them to local people. Eventually, when Europe settled down after the Napoleonic upsets and tourists began to visit this lovely land, Fischer produced other simple novelties that soon found a ready sale. He was encouraged by the Berne Government, and the craft has now become an institution.

MECCANO MAGAZINE

Junior Section

THIS month I have stories of the exploits of two youthful enthusiasts, one in the United States and the other in the Union of South Africa.

The central figure in the first of these, whose portrait is seen on the right, is Richard Unglert, who lives in New Jersey. In a copy of *Life* Richard saw a picture showing President Eisenhower looking with obvious delight at a fine display of Dinky Toys in the window of a shop in Geneva, Switzerland, during the international conference held there last year. Now Richard, who is eight years old, is a Dinky Toys enthusiast. He immediately wrote to the President to tell him that he was a collector, and to suggest that Dinky Toys would be the very thing for the President's grandsons.

Richard Unglert, the boy who wrote about Dinky Toys to President Eisenhower.

Perhaps the President knew this already! Anyway, he was very greatly interested, and he sent the boy a very nice reply, telling him how much he appreciated the kind interest that had prompted him to write. Now Richard does not know whether to frame the letter, or to put it carefully away in his father's safe deposit box.

Now for the South African incident, which is illustrated by the splendid picture at the foot of the page. The boy seen in this is Peter Korck, who is nine years old and is the youngest member of the Cape Peninsula M.C.

Every year a great Hobbies Fair is held in Cape Town. For the 1955 event, which was opened by Stephen Fry, captain of the South African Rugby football team that opposed the British Lions during their tour of South Africa last summer, the Cape Peninsula Club arranged a very large and comprehensive display of models built by its members. Among these were Peter's strange companions, two Meccano robots, with whom he took regular walks, the spectacle fascinating the 38,000 visitors to the Exhibition beyond all expectations. The Meccano men promenaded practically continuously throughout the Fair, and must have covered about five miles.

There were 28 working models in the Club's display, all controlled from two central switchboards. They included two clocks built by Mr. de Beer, Leader of the Club, both of which worked continuously and furnished the Fair with accurate time,

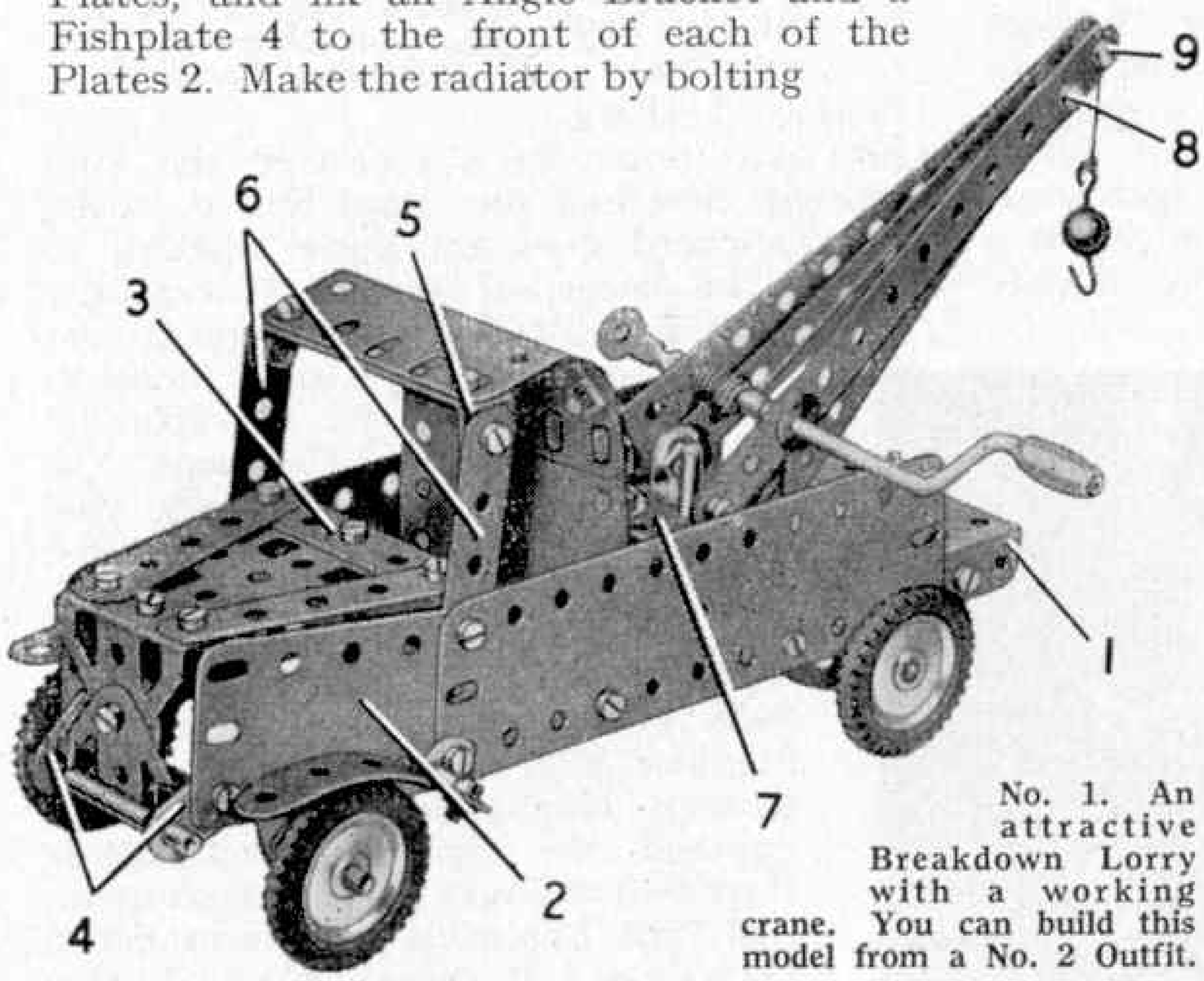
Peter Korck, the youngest member of the Cape Peninsula M.C., takes a stroll with two Meccano robots.

Easy Model-Building

Spanner's Special Section for Juniors

A BREAKDOWN Lorry built from Outfit No. 2 and a Cargo Ship designed to make use of the parts in Outfit No. 4, are the two new models that I have selected for you this month.

You can start making the Breakdown Lorry by bolting a $5\frac{1}{2}'' \times 1\frac{1}{2}''$ Flexible Plate to each side of a $5\frac{1}{2}'' \times 2\frac{1}{2}''$ Flanged Plate 1. The Flexible Plates form the sides of the cab and the body, and they should be lengthened towards the front by $2\frac{1}{2}'' \times 1\frac{1}{2}''$ Flexible Plates 2 to make the sides of the bonnet. Now bolt a $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strip 3 between the Flexible Plates, and fix an Angle Bracket and a Fishplate 4 to the front of each of the Plates 2. Make the radiator by bolting together two Trunnions, then fix the lower one of these to the Angle Brackets already mentioned. Pass a 2″ Rod through the Fishplates 4 and use Spring Clips to hold it in place.



No. 1. An attractive Breakdown Lorry with a working crane. You can build this model from a No. 2 Outfit.

To make the top of the bonnet bolt two $2\frac{1}{2}''$ Strips between the Double Angle Strip 3 and the radiator, and fix one Flat Trunnion to the Double Angle Strip and another to the radiator. You should make the back and roof of the cab by bolting together a $2\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plate and a U-section Curved Plate. Now open the U-section Curved Plate out slightly and fix to it a $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strip 5. Bolt the Double Angle Strip to two $2\frac{1}{2}''$ Strips 6 fixed to the sides of the cab.

Next the wheels can be fitted to the model. These are 1″ Pulleys with Motor Tyres and the axles are $3\frac{1}{2}''$ Rods. The rear axle is supported in $2\frac{1}{2}''$ Stepped Curved Strips bolted to Flanged Plate 1, and the front axle is mounted in Fishplates fixed to the Flexible Plates 2. Space the front wheels from the Fishplates by Washers. The front mudguards are slightly curved $2\frac{1}{2}''$ Strips, and they are bolted to Angle Brackets.

To make the crane bolt four Angle Brackets to a Bush Wheel 7. Fix a $5\frac{1}{2}''$ Strip to each Angle Bracket and connect the Strips together by a $\frac{3}{8}''$ Bolt 8, using a nut and two Washers to space apart the Strips on each side. Pass a second $\frac{3}{8}''$ Bolt 9 through one Strip and fix it in the one on the opposite side by two nuts.

The crane is mounted on the lorry so that it can be turned from side to side. Fix a 2″ Rod in the Bush Wheel 7 and pass this Rod through Flanged Plate 1, and through one lug of a $\frac{1}{2}''$ Reversed Angle Bracket, which you should bolt underneath the Flanged Plate. Use a Spring Clip to hold the Rod in place. Now take a Crank Handle and pass it through two of the $5\frac{1}{2}''$ Strips, at the same time screw a Cord Anchoring Spring on its shaft between the two Strips. Hold the Crank Handle in place with a Spring Clip and a Rod and Strip Connector. Tie a short piece of Cord to the Cord Anchoring Spring, pass it over the Bolt 9 and attach to its free end a small Loaded Hook.

Parts required to build the Breakdown Lorry: 4 of No. 2; 6 of No. 5; 4 of No. 10; 8 of No. 12; 2 of No. 16; 1 of No. 17; 1 of No. 19g; 4 of No. 22; 1 of No. 24; 4 of No. 35; 44 of No. 37a; 40 of No. 37b; 6 of No. 38; 1 of No. 40; 2 of No. 48a; 1 of No. 52; 1 of 57c; 2 of No. 90a; 2 of No. 111c; 1 of No. 125; 2 of No. 126; 2 of No. 126a; 4 of No. 142c; 1 of No. 176; 2 of No. 188; 2 of No. 189; 1 of No. 190; 1 of No. 199; 1 of No. 212.

The Cargo Ship is shown in Figs. 2 and 3. Each side of the hull, starting from the

prow, is made from a 2½″ × 1½″ Triangular Flexible Plate 1, a 2½″ × 2½″ Flexible Plate, a 5½″ × 1½″ Flexible Plate, a 5½″ × 2½″ Flexible Plate 2, a 2½″ × 1½″ Flexible Plate and a 4½″ × 2½″ Flexible Plate 3. These Plates are bolted together and are strengthened on the inside by two 12½″ Strips. A 2½″ × 1½″ Triangular Flexible Plate 4 and a 3½″ Strip 5 are fixed to each side of the hull as shown.

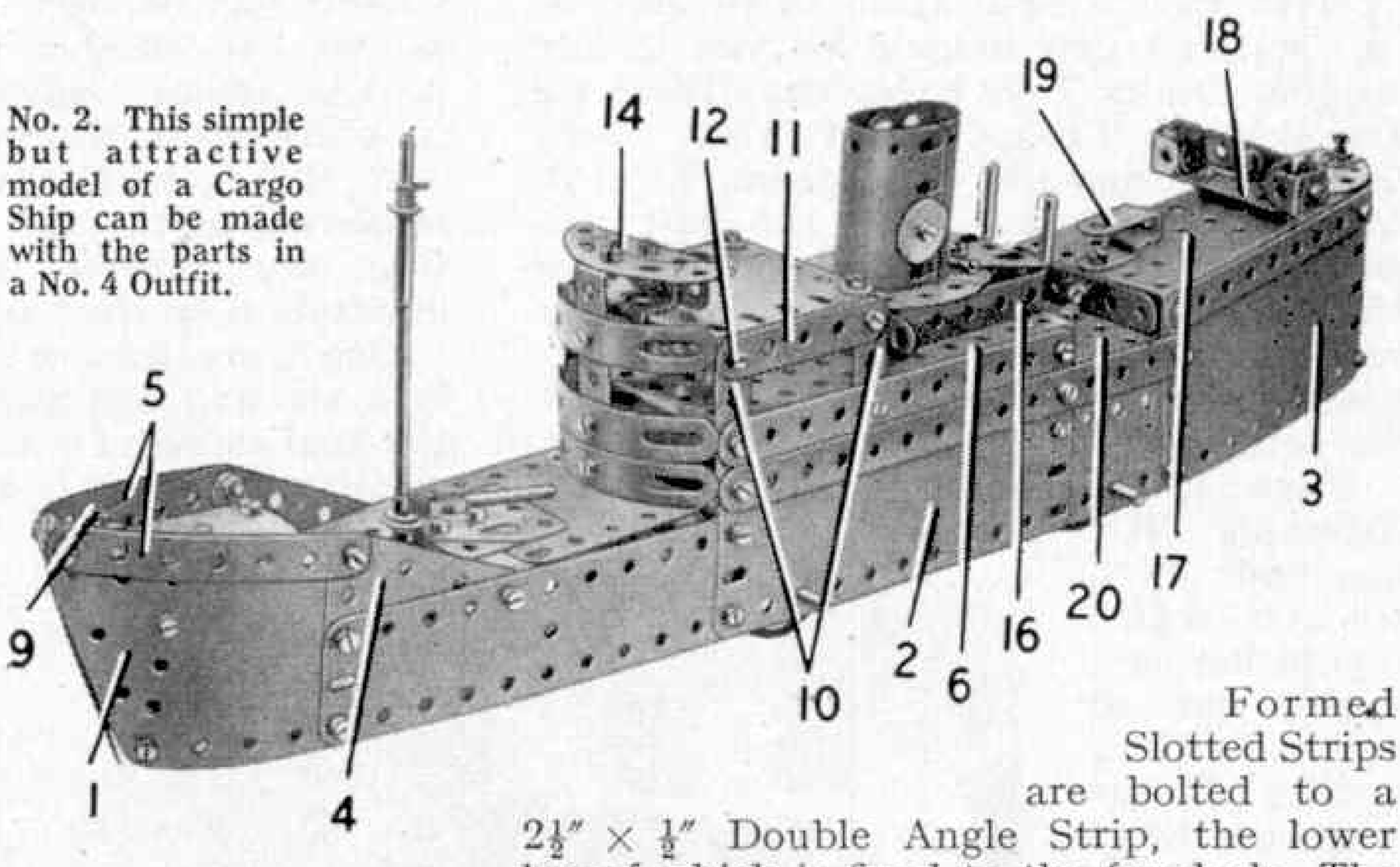
The sides are connected at the prow by Angle Brackets, and at the stern by a 1 11/16″ radius Curved Plate. A 5½″ × 2½″ Flanged Plate 6 is fixed between the upper edges of Plates 2 and two 5½″ Strips are bolted to the outside of each of these Plates. The lower 5½″ Strip on each side is extended towards the stern by another 5½″ Strip, which is fixed also to the Plate 3. The upper edges of the Plates 3 are strengthened by curved 5½″ Strips.

The deck at the prow is made by fixing a Flanged Sector Plate 7 and a 2½″ × 2½″ Flexible Plate between the sides. Two Semi-Circular Plates 8 are attached to the Plates 4 by Angle Brackets, and are connected by two Fishplates joined by a ⅜″ Bolt 9. The foremast is made from a 3½″ and a 1½″ Rod joined by a Rod Connector and is fixed in a Bush Wheel.

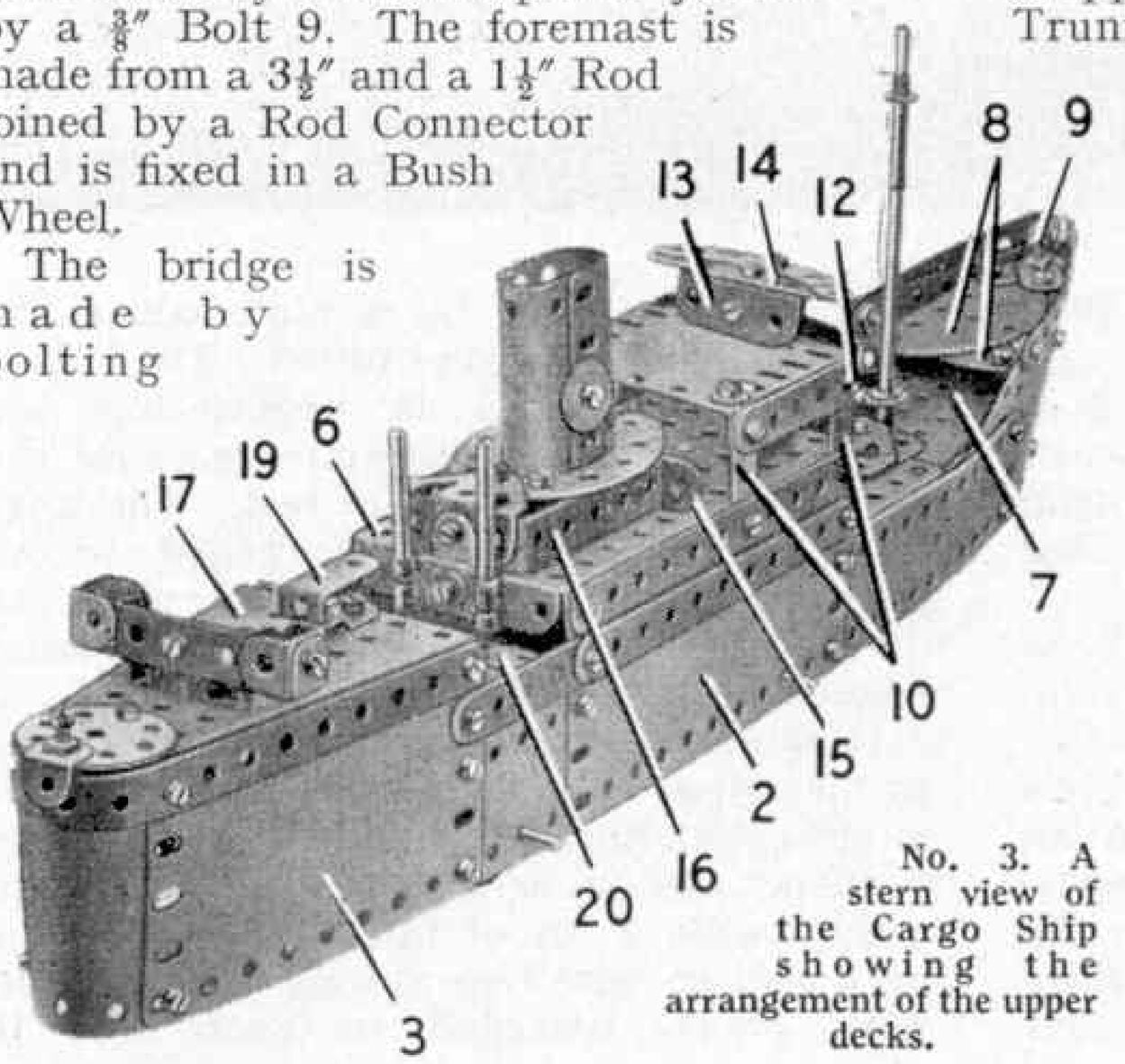
The bridge is made by bolting two vertical 2½″ Strips 10 to each side. These support a 2½″ Strip 11, and a 2½″ × ½″ Double Angle Strip is held between the front pair of Strips 10 by bolts 12. A 2½″ × 2½″ Flexible Plate is connected to the Strips 11 by Angle Brackets. Three Formed Slotted Strips are bolted to a 2½″ × ½″ Double Angle Strip, the lower lug of which is fixed to the foredeck. The upper lug supports a 2½″ Stepped Curved Strip and a Trunnion 13. A 2½″ Strip 14 is bolted to the Trunnion, which is attached to one lug of a ½″ Reversed Angle Bracket fixed to the Double Angle Strip held by bolts 12.

The funnel consists of two U-section Curved Plates fixed to a 2½″ Strip 15, which is attached to two 2½″ × ½″ Double Angle Strips 16 bolted to a Trunnion. Two 2½″ Stepped Curved Strips are connected to the Trunnion by Fishplates. The Trunnion is attached to a Fishplate bolted to the Plate 6, the bolt holding also two Right Angle Rod and Strip Connectors carrying 2″ Rods.

A 2½″ × 1½″ Double Angle Strip 18 and a Bent Strip 19 are fixed to a Flanged Sector Plate 17. A Reversed Angle Bracket bolted to Plate 17 supports a 2½″ × 1½″ Flanged Plate.



No. 2. This simple but attractive model of a Cargo Ship can be made with the parts in a No. 4 Outfit.



No. 3. A stern view of the Cargo Ship showing the arrangement of the upper decks.

Parts required to build the Cargo Ship: 4 of No. 1; 8 of No. 2; 2 of No. 3; 9 of No. 5; 5 of No. 10; 2 of No. 11; 8 of No. 12; 3 of No. 16; 2 of No. 17; 2 of No. 18a; 4 of No. 22; 1 of No. 24; 1 of No. 24a; 4 of No. 35; 87 of No. 37a; 79 of No. 37b; 14 of No. 38; 2 of No. 38d; 1 of No. 44; 1 of No. 48; 6 of No. 48a; 1 of No. 51; 1 of No. 52; 2 of No. 54; 4 of No. 90a; 6 of No. 111c; 2 of No. 125; 2 of No. 126; 2 of No. 126a; 4 of No. 155; 1 of No. 176; 2 of No. 188; 2 of No. 189; 4 of No. 190; 2 of No. 191; 2 of No. 192; 2 of No. 199; 1 of No. 200; 1 of No. 212; 2 of No. 212a; 1 of No. 213; 2 of No. 214; 3 of No. 215; 4 of No. 221.

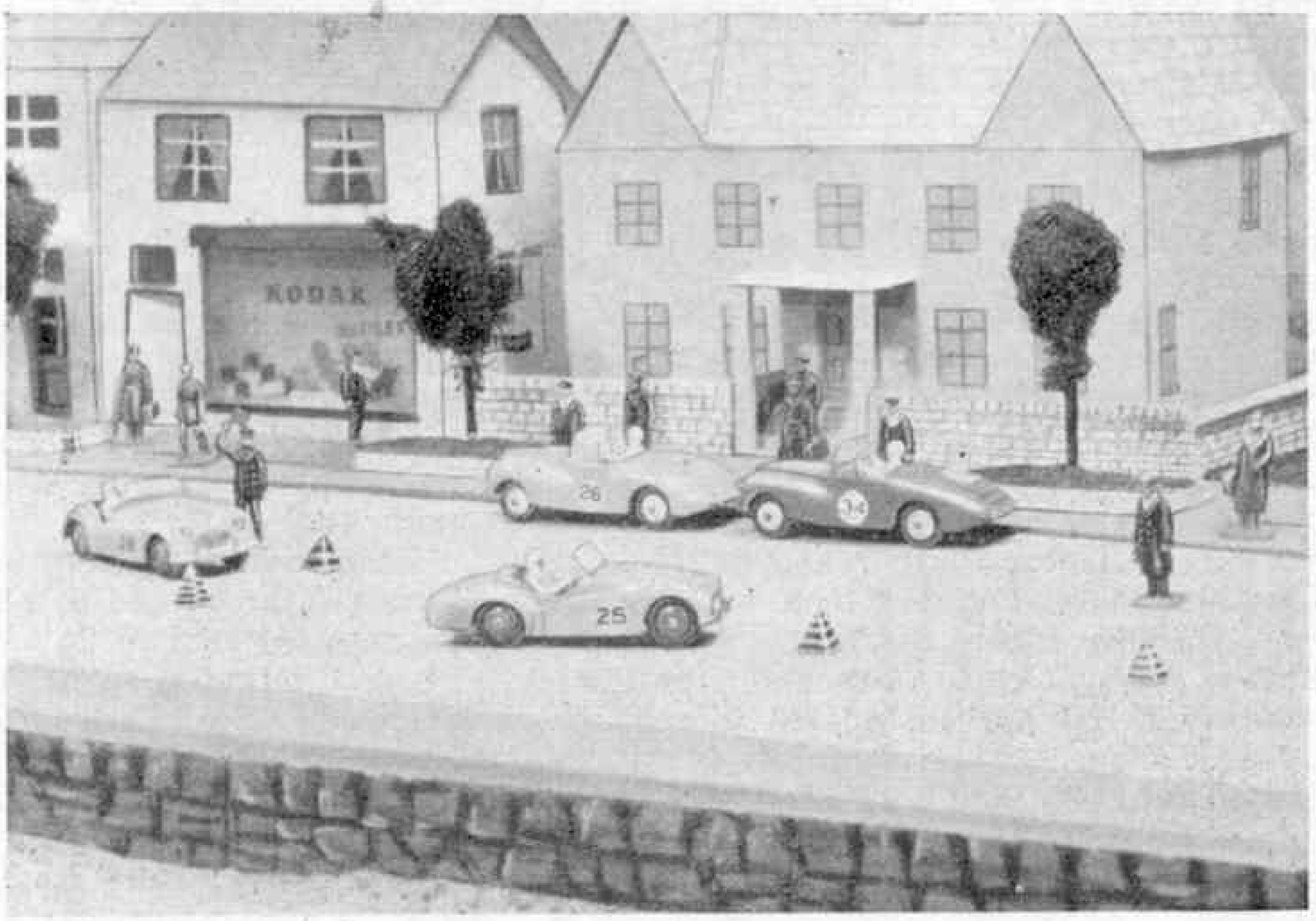
DINKY NEWS

Fun with Your Sports Cars

By **THE TOYMAN**

THIS month once again there are two splendid new models for you to add to your Dinky Toys collection. These are the Triumph TR-2, No. 111 in the Dinky Toys range, and the Volkswagen, No. 181. My correspondence over the last few months has included so many requests for these two cars that they are certain of a real welcome, and I am sure every enthusiast will be keen to add them to his collection.

Since its introduction in 1952 the Triumph TR-2 has built up a world-wide reputation as a sports car of outstanding quality. It has achieved many successes in races and rallies against the competition of much larger and costlier vehicles, so it is no surprise that Dinky Toys collectors have asked repeatedly for a model of this fine car. Now the Dinky Toys Triumph TR-2 is available and to mark the introduction of this splendid little model I have arranged two special scenes representing the final tests in a motor rally.

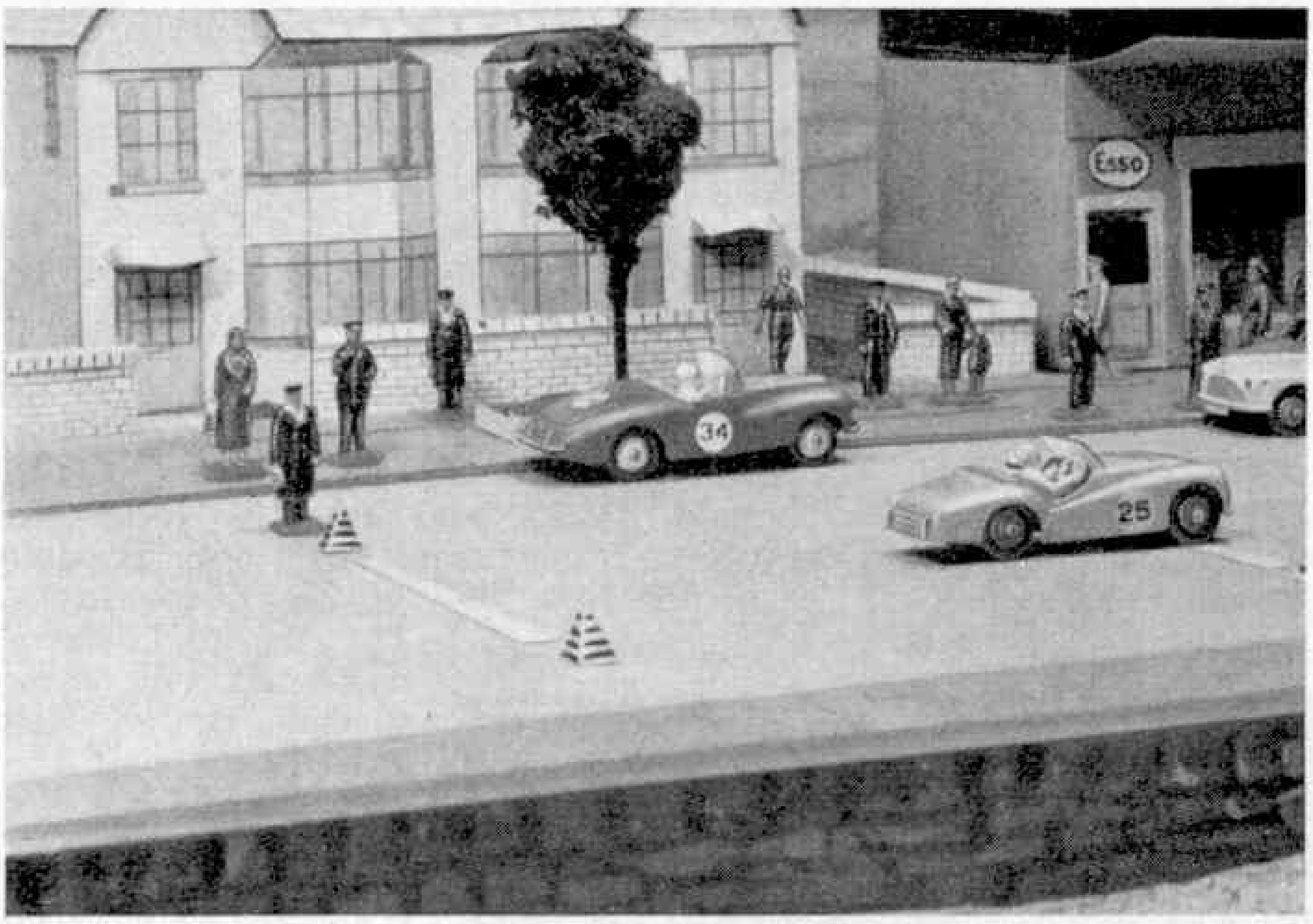


An exciting moment in a miniature motor rally. The driver of the Triumph TR-2 is weaving his way through the marking cones.

The Dinky Toys Triumph TR-2 is available in two distinct colour schemes. It can be obtained with the body in blue, with the seats, dashboard and wheels finished in red, or with the body in an attractive salmon pink with blue seats, dashboard and wheels. In both cases the miniature drivers are finished in white to represent their overalls, but each colour scheme has its own competition number, so you can enter a team of two TR-2's in the rallies and races you organise. A transparent windscreen is fitted. All told this new Dinky Toy is a perfect miniature of the real car, as you can see from my pictures and from the colour illustration on the back cover of this issue.

One of my pictures shows a TR-2 engaged in a steering and manœuvrability test in the final stages of a rally. The test consists of driving the car in and out of a series of small markers, and takes place along the promenade of a seaside resort. The driver of the first TR-2 is negotiating the markers, while his team mate waits for the starter's flag to begin the test. The next scene shows the TR-2 engaged in an acceleration and braking test, and my driver has managed to stop with his front wheels dead on the braking line.

Of course, in miniature it is not practical to organise a full scale rally for your models, but final tests on the lines I have outlined can be arranged very easily and will provide a lot of fun. You can make up a real competition among your friends, with points awarded in each test to



Braking tests in progress. On this occasion the Triumph TR-2 has been brought to a stop with its front wheels exactly on the line.

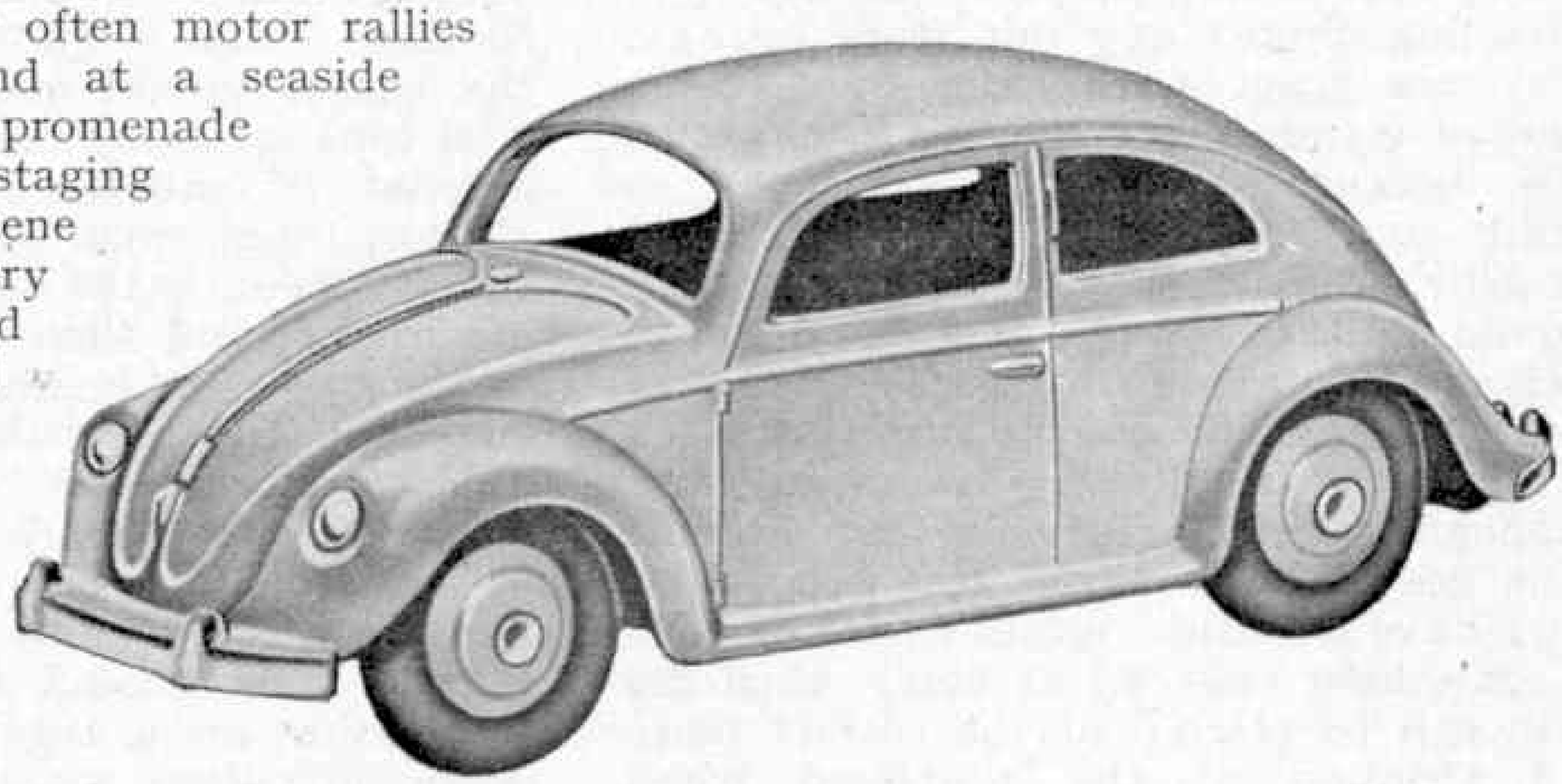
decide the winner. For example in a steering test each competitor would have to "drive" his car in and out of the markers to complete the course within a certain time. A maximum of say 10 points could be awarded for this event, with one point taken away for each time the competitor touches a marker and for each second longer than the time limit he takes to complete the course.

A thrilling braking test can be arranged just as easily by having each competitor push his car by hand up to a certain point. The car must then be released so that it comes to a standstill as near as possible to a line drawn on the baseboard. A point can be taken from the maximum allocated for this test for each inch the car stops away from the line.

Other tests can be arranged equally easily, and a simple scene set up as shown in my pictures will add to the realism and interest. Very often motor rallies are planned to end at a seaside resort, where a wide promenade is available for staging the final tests. A scene of this kind is very easy to arrange, and you can make good use of many of the buildings from previous layouts.

The amazing success of the Volkswagen, the subject of our second new Dinky Toy this month, is one of the most interesting developments in post-war motor production. You can judge the popularity of this car from the fact that the millionth vehicle left the production line of the makers last year. By general standards the Volkswagen is unorthodox, but the unusual design has been thoroughly justified by the performance of the car. The Volkswagen is powered by a flat, four cylinder, air-cooled engine mounted low down at the back of the car, and another notable feature is that it has exceptionally good independent suspension on all wheels.

The new Dinky Toy is a fascinating reproduction of this popular car, and is just the thing to add variety to your layouts and scenes. The model is available in grey with blue wheels or in an attractive green with a distinctive shade of the same colour for the wheels. There is sure to be a big demand for the Dinky Toys Volkswagen, so make certain of obtaining your model by visiting your Dealer as soon as you can.

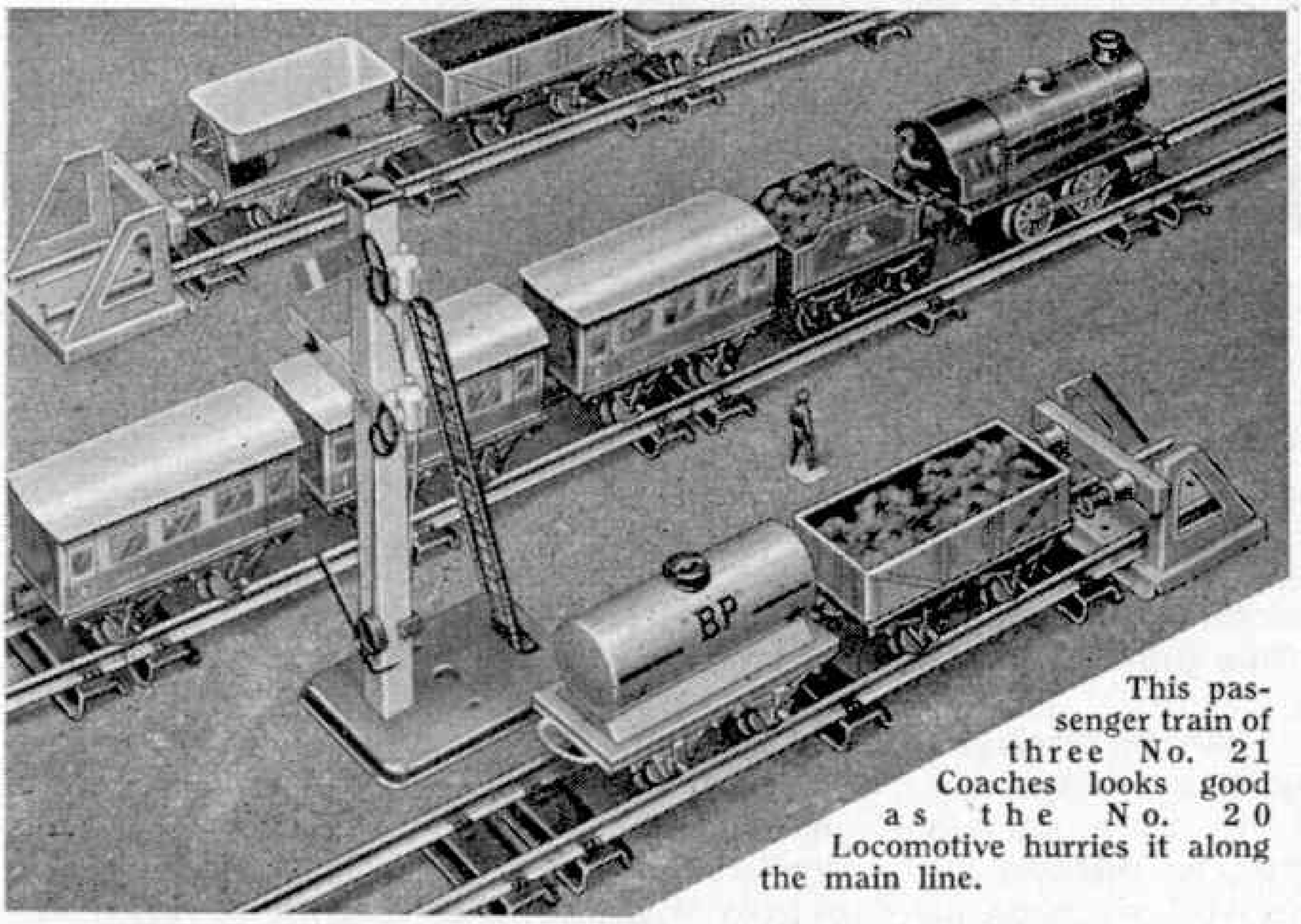


One of this month's new Dinky Toys. The Volkswagen, No. 181.

See How They Run

By "Tommy Dodd"

I FIND that many readers who write to me are surprised when they discover how much good train running they can get with a relatively simple layout. When thinking of the ideal system that we hope to attain some day, probably most of us look forward to something really big, with plenty of Points, Crossings, loop lines and so on. It is good of course to be hopeful, but while waiting for our dream layout we can have some real fun.



This passenger train of three No. 21 Coaches looks good as the No. 20 Locomotive hurries it along the main line.

The addition of more track, usually Straight Rails to make the layout longer, and the addition of Points in order to make one or two sidings possible, are among the earliest steps to be taken in extending almost any miniature railway. They are easy in the Hornby System, whether we are using 1 ft. or 2 ft. radius rails, because the Points correspond in length and curvature to the standard Straight Rails and to the respective Curved Rails.

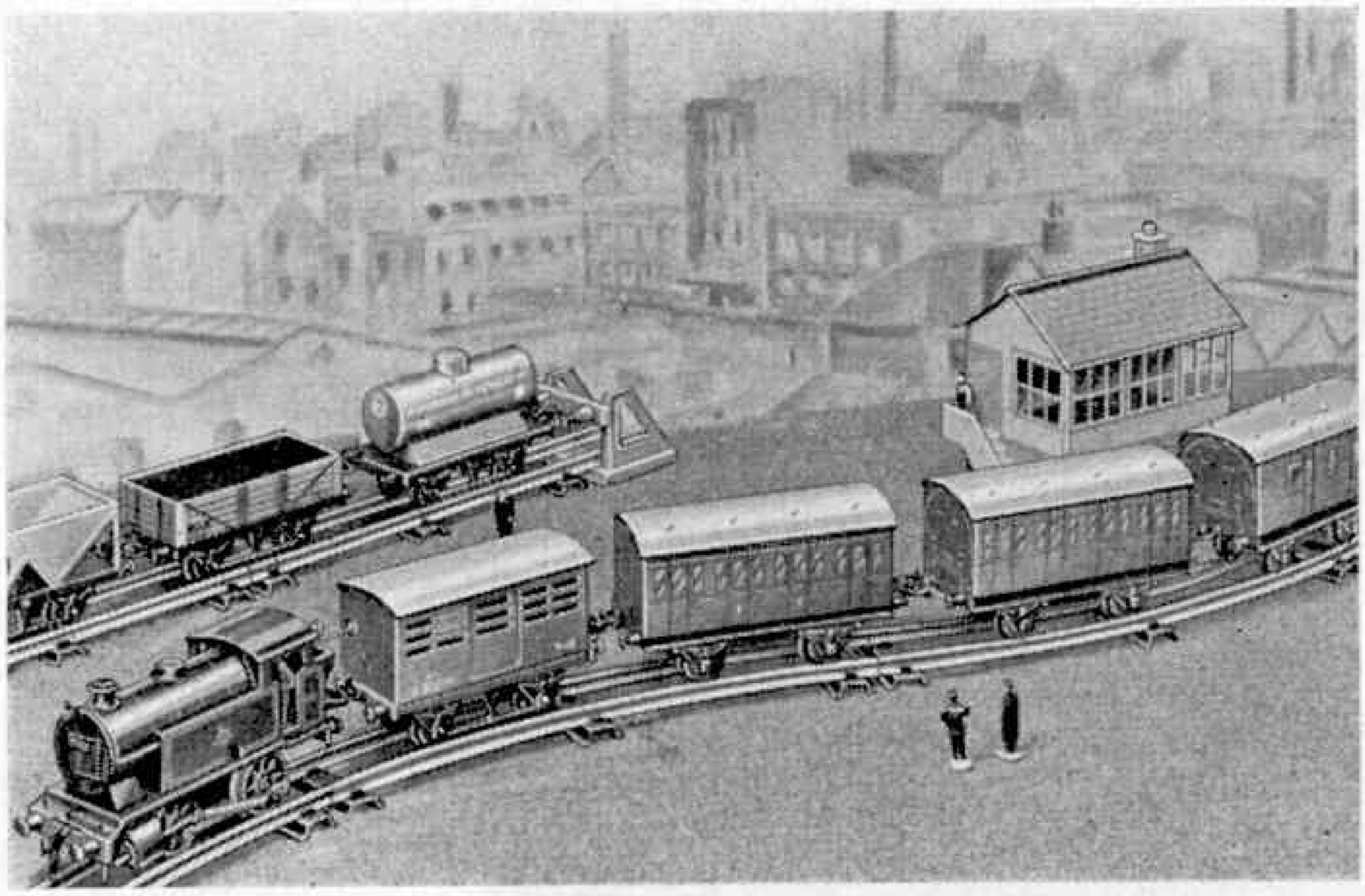
Even before we reach the stage of having sidings the plain continuous track of the form usually known as an oval, although it isn't one really, can provide some good long runs for our train. And if we have a station, either a Hornby one or something built up at home, then the train can be started at the correct place and stopped at the platform when required, according to the services we are running.

To stop the train we use a Brake Rail of the type suited to the engine that we have. All current Hornby Locomotives, except the No. 20, require the B.B.R. Straight Brake and Reverse Rail, but reversing from the track is only possible with the Nos. 50 and 51 Locomotives. The No. 20 Locomotive has its own special Brake Rail included in its Train Set.

If we are not able to include a Brake Rail, possibly because of the position of the station or the length of the train, then we can always bring the train to a stand by hand. One has to handle the engine in order to wind it up, so that a little more hand work will really do no harm. In fact, I am sure that most young drivers of Clockwork engines, and not a few older ones, enjoy this part of the job. It makes them feel that they really are in charge of their engines!

Another idea is to wind the engine just sufficiently for the particular job to be done. The amount of wind to give will vary according to the load and in order to have some definite thing to go on, the layout should not be changed while trial runs are being made. With a certain amount of practice and experience, a Hornby engineman can start off from the platform, make the required number of circuits, and then come to rest again practically where he started from. Different engines will probably need slightly differing amounts of "*keying-up*," as one of my younger friends once called it.

This sort of continuous running is sometimes criticised by those who maintain that a train should run from one end to another on a layout. But nowadays space difficulties usually make this form



Daily milk traffic is the reason for the addition of the Van between the engine and the coaches of this stopping train, here seen on a reverse curve.

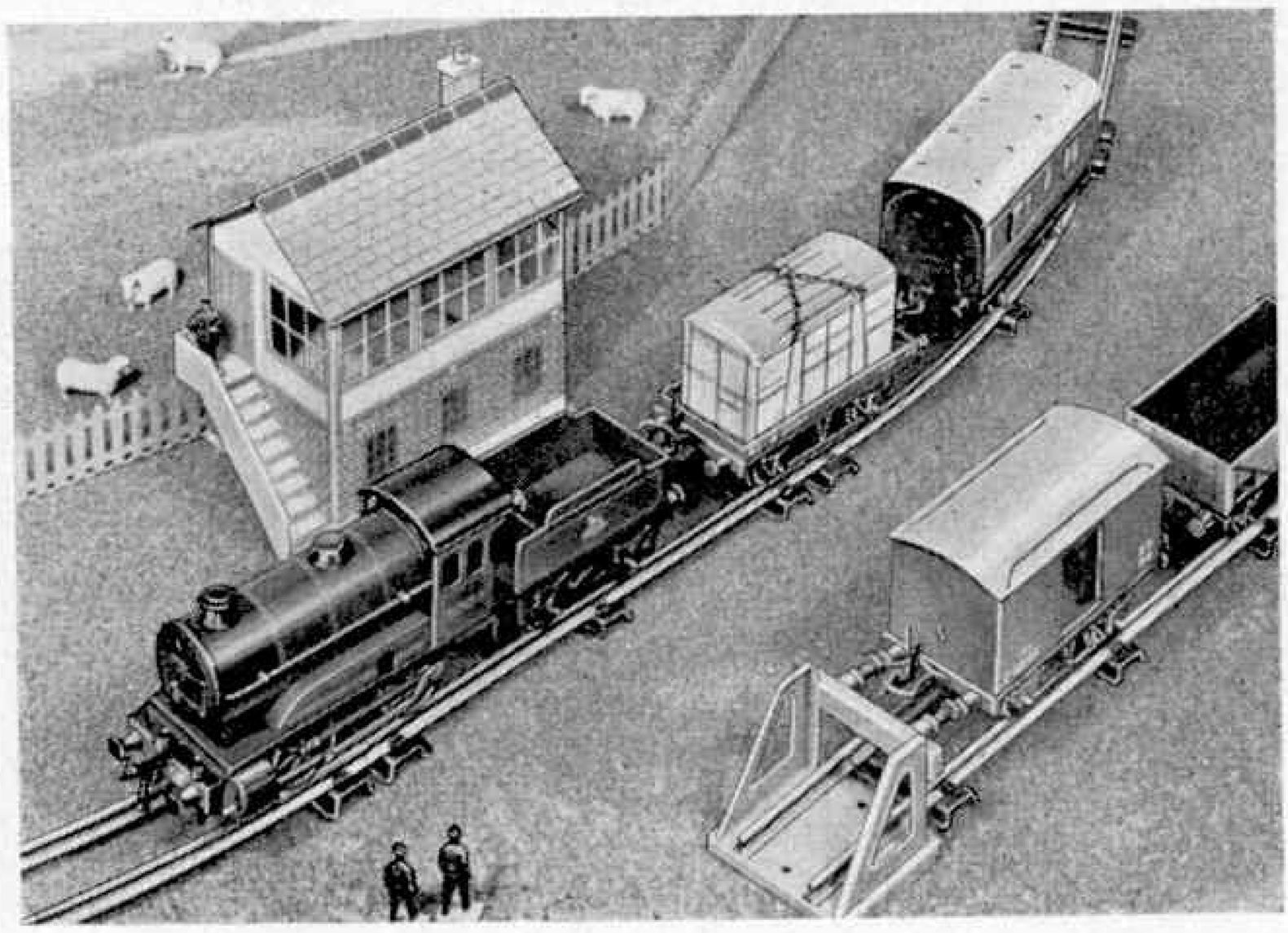
of railway next to impossible. In any case, as imagination has to be exercised in order to get the right atmosphere into our railwaying, there is surely no harm in allowing our single station to change its identity each time the train comes through! It is one way of multiplying the number of stations, and so giving a long run!

Different types of trains will call for variations in the rolling stock composing them, and some useful ideas have appeared in the *M.M.* on this point from time to time. Even a little layout run by Nos. 20/21 equipment can have its passenger express and the picture on the opposite page shows a busy little train made up to one Coach over the number provided in the standard Train Set. In the picture the engine seems to be making the most of a fairly good length of straight track. At least that is the impression that it gives me. Don't you agree?

Other ideas have inspired the owners of the trains seen in the illustrations on this page. Thus the stopping train in the upper picture has a Hornby Milk Van attached to the engine. We can arrange this regularly — as a daily affair — with certain trains.

Special traffic is obviously the reason for the short train in the lower picture, this consisting simply of a single low sided wagon with Container and a Passenger Brake Van. Such things are not impossible on real railways, as those of you who are keen train watchers will agree. I have seen a real cattle special of two vehicles only, and a brake van, so the single Container and Van shown in our picture seems quite reasonable.

Special traffic for which passenger rolling stock is required also can be arranged from time to time on a Hornby railway. Sometimes No. 41 Coaches will be suitable, say for short-distance football specials. Longer-distance specials will require No. 51 Coaches, as these represent corridor stock, and perhaps the engine may carry a special headboard.



An obviously important special, of two vehicles only, in charge of a Hornby No. 50 Locomotive.

Of General Interest

The Open-Top Special

Open-topped double-decker buses, generally painted in some light colour, were already familiar at a number of coastal resorts, but it is curious that they had not been seen before 1955 in sunny Torquay. Last year, however, six handsome open-topped A.E.C. Regents were placed on selected Torquay, Paignton and Brixham local services, and they will become a regular summer feature.

The high spot is a new summer-only hourly service from St. Marychurch through Torquay and Paignton to Broadsands, following the sea front practically all the way. Wonderful views are to be had, and often warships are seen at anchor. Children seem greatly to enjoy the low railway bridge at Seaway Road, Paignton, taken at 2 m.p.h. from a dead stand after the conductor has warned everybody upstairs to keep their heads low!

The buses are painted cream with red bands. They are actually veterans, some of the twenty-six built in 1933-5 to replace Torquay's trams. Thirteen have since been completely modernized and rebodied, and one converted into a tree-lopping van that *strictly* perhaps was the first Devon General open-topper!

Spotters' Corner! The numbers of Torquay's Open-Top Specials are 203, 205, 210, 215, 219 and 224.

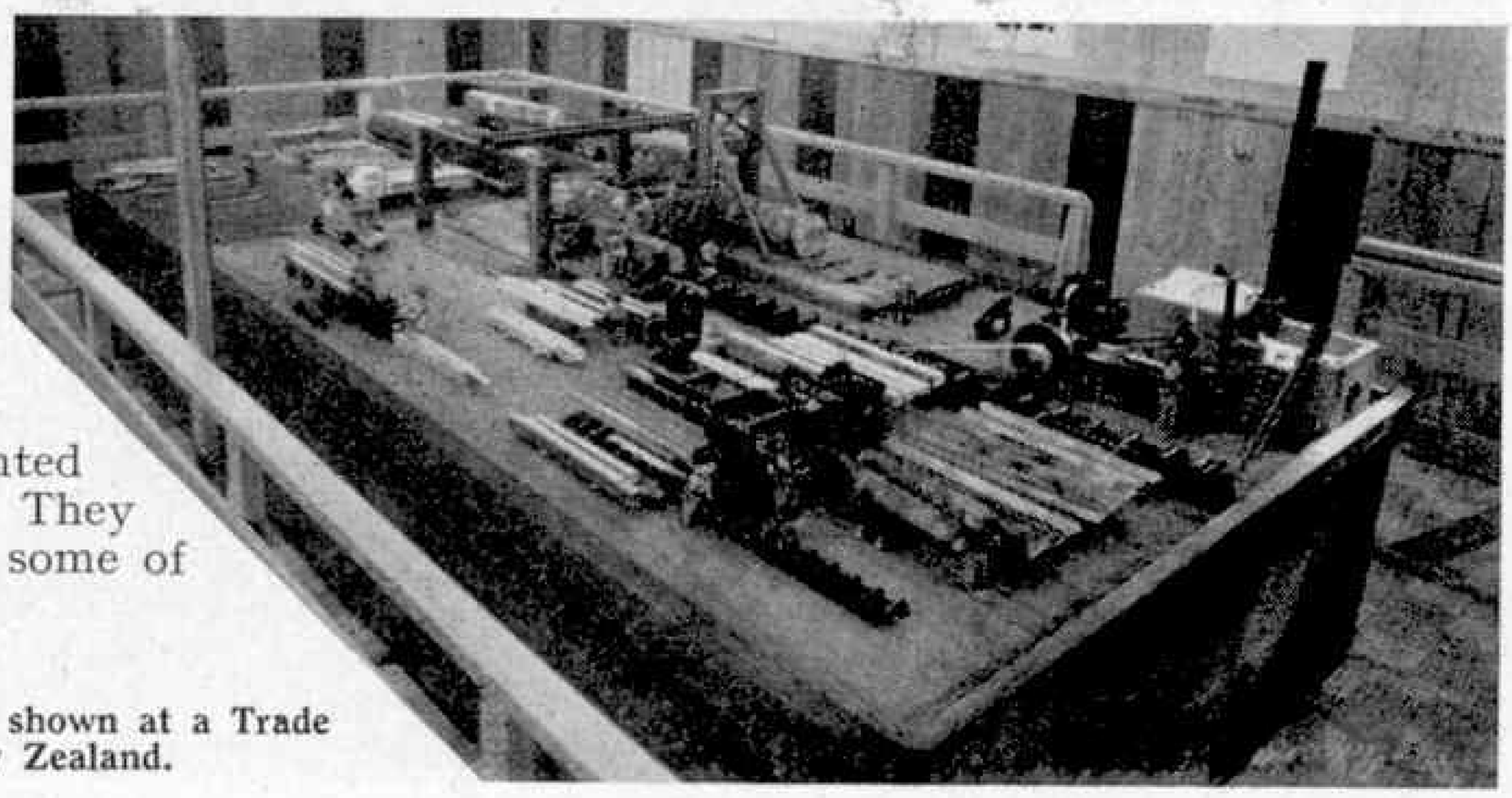
R. P. WALFORD
(Bovey Tracey).

This photograph of a Devon General "Torquay Open-Top Special" was taken by R. P. Walford, Bovey Tracey, from another one about to pass it.

A Fine Sawmill Model

The lower photograph on this page shows an attractive working model of a saw mill seen at a Trade Fair in Napier, New Zealand, last year. It was erected by Tuck Bros. Ltd., who are timber merchants in Napier, and great use was made of Meccano parts in making it. As many as 400 parts were incorporated, together with an E20R Electric Reversing Motor.

The model worked perfectly throughout the Exhibition, and ingenious sound effects were produced so as to give the actual sound of timber logs under the saw.



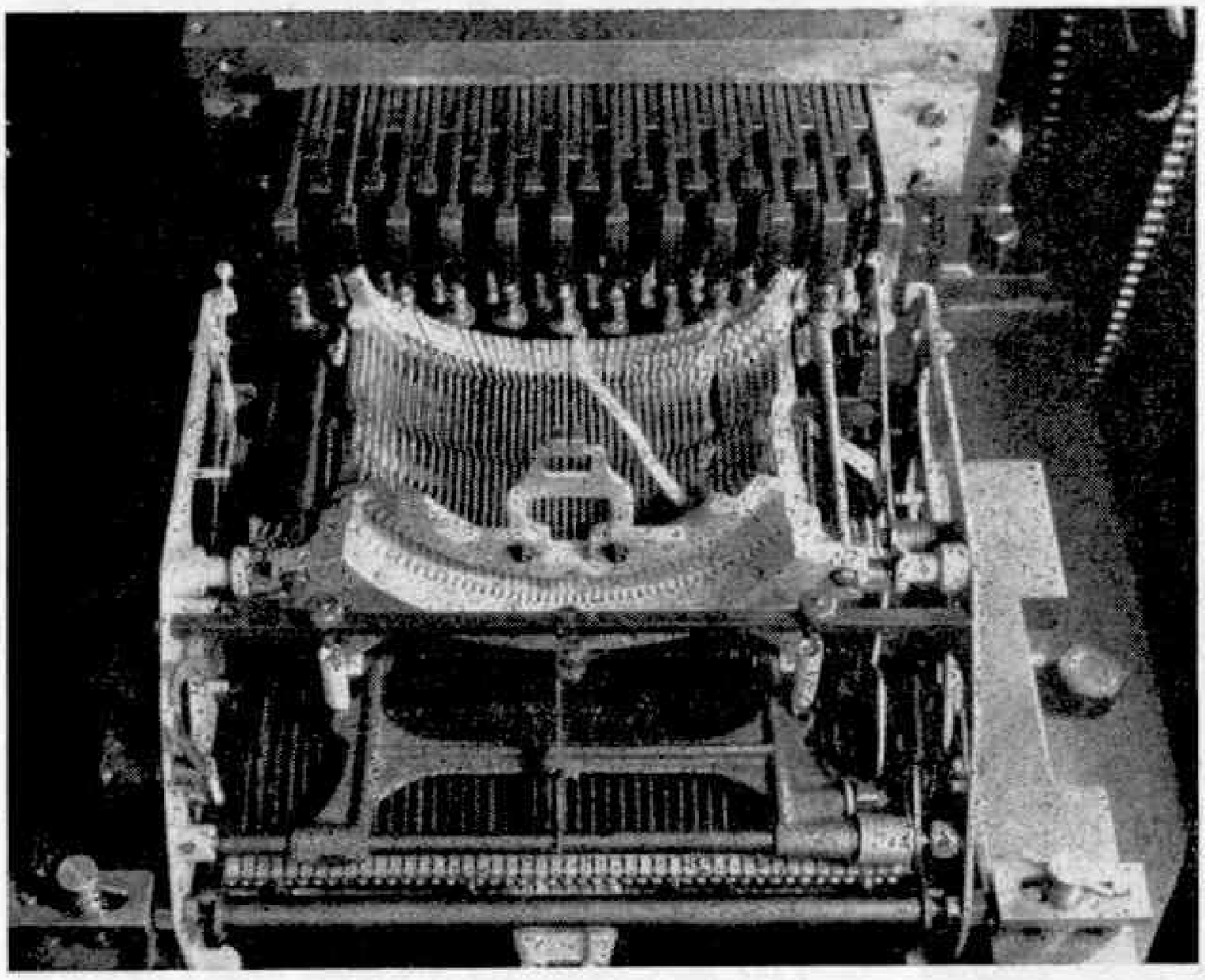
A fine model of a saw mill shown at a Trade Fair in Napier, New Zealand.

Typewriter Story

By Trevor Holloway

TECHNICALLY speaking, making typewriters is classified as a "light" engineering job. But if you were to visit a large typewriter factory you could imagine you had been wrongly directed to a works equipped to turn out tanks or bulldozers!

Surely all those huge presses you see aren't needed to make such compact little machines! And the nerve-shattering din coming from another department cannot have any connection with the making of bits and pieces for typewriters!



The truth is that making typweriters is not such a light industry as many people imagine. To clear up any misunderstandings we may have on the topic, let's look in on the Imperial Typewriter Company at Leicester and get the real facts for ourselves.

We get a few surprises in the first few minutes, for our guide casually informs us that the Company employs over 2,200 people, owns about 400,000 square feet of factory space and markets machines from Alaska to Zanzibar—in other words, the world over.

Perhaps the fact that surprises us most is that in a mere half cubic foot of typewriter there are something like 2,400 parts. To get so much into so little isn't done by wishful thinking—it's done by skilled craftsmen, and women, all working with a grand team spirit in accordance with a meticulously detailed production programme.

Apart from casting and raw materials, practically every part of an Imperial machine is made in the Company's own works, either at Leicester or at a large modern plant at Hull. And many tools and many operations are usually called for to make just one component. The more we think of those 2,400 parts, the easier it is to understand why such a huge and highly-geared organisation is needed.

The story of a typewriter really begins with the Backroom Boys.

All typewriter parts are thoroughly lubricated and tested for not less than an hour on an automatic exercising machine on which the fingers strike 900 times a minute. The illustrations to this article are reproduced by courtesy of the Imperial Typewriter Company Ltd.

The old-time cartoonist's idea of inventors being long-bearded and dreamy individuals doesn't apply to the staff of Imperial's experiment and research department. Practical invention has been aptly described as one-tenth inspiration and nine-tenths perspiration! The design of a new model, or even a new part, means studying all that has been done before, and then conducting a long series of experiments to see if the new idea is workable.

Having decided that an idea is sound, the design is handed over to the drawing office, whose job it is to transform the idea into a manufacturing proposition. This of course includes designing new and special tools to see the job through.

The nerve centre of the Imperial factory is the works office, which controls the flow of work and the maintenance of stock throughout the entire organisation. A network of pneumatic tubes carries

A frame of parts being taken out of a nickel plating vat. At the next stage they are plated with chromium.

messages between all vital departments, and so well-organised is the works office that at any given moment its information is never more than a quarter of an hour behind the actual state of affairs in the factory as a whole!

Now to get down to production proper. Our first port of call is the castings shop. But didn't we say no castings were made on the premises? True, but the castings supplied by outside foundries have to be turned, milled, drilled and tailored generally by machines tuned to very fine limits — sometimes to as close as half a thousandth of an inch. There's no margin for error in this department. Eagle-eyed inspectors are continually on the prowl and even the gauges used for inspection are inspected!

Now we are heading for the auto shop, where screws, rivets and other fixing units are produced. The place seems full of machines—there are 145 in fact—but is only sparsely sprinkled with operatives. This is because one setter may have charge of as many as six machines.

These machines are marvels of ingenious mechanism. Basically they are lathes, machines in which a bar of metal can be revolved while cutting tools get to work on it. They are entirely automatic and perform one operation after another, their nourishment being rods of metal up to 10ft. in length which they consume with appetites that are never satisfied. In return they pour out cascades of big screws, small screws, screws with round shoulders, screws with square heads, rivets or odd-shaped bits and pieces which typists never dream go into their machines.

Our only complaint about these untiring robots is the noise they make. It is caused by the long rods of metal rattling in the guard tubes en route to the tortuous process that will convert them into one or other of those 2,400 components.

Now to the press shop, the department which looks as though it might be the birthplace of tank tracks. Here stand huge machines, one of which can deliver a blow of 100 tons. A large proportion of the parts that go to make up a typewriter is made from strips of steel, punched out and formed to the required shape. The process is known as "blanking," and the punches and their

Reaming and facing the ends of typewriter shift levers. The parts, seen in the foreground, are held in a fixture during this operation.

corresponding dies stamp out such components as key levers at speeds up to 25,000 parts an hour.

When the parts come from these presses, their cut edges are very sharp and to remove these keen edges the parts are tumbled in pans of silver sand, and then in barrels of sawdust, to remove all traces of sand, before passing on to further operations.

Have you ever heard a riveting machine at work? If you haven't, now's your chance to hear a whole regiment of them in action —row upon row of these efficient, but ear-shattering robots going flat out, joining this to that with a din like ten thousand motor cycles revving up. We guess the nimble-fingered girls who tend them can't get a word in edgeways until break-time—unless they've invented a sign language of their own!

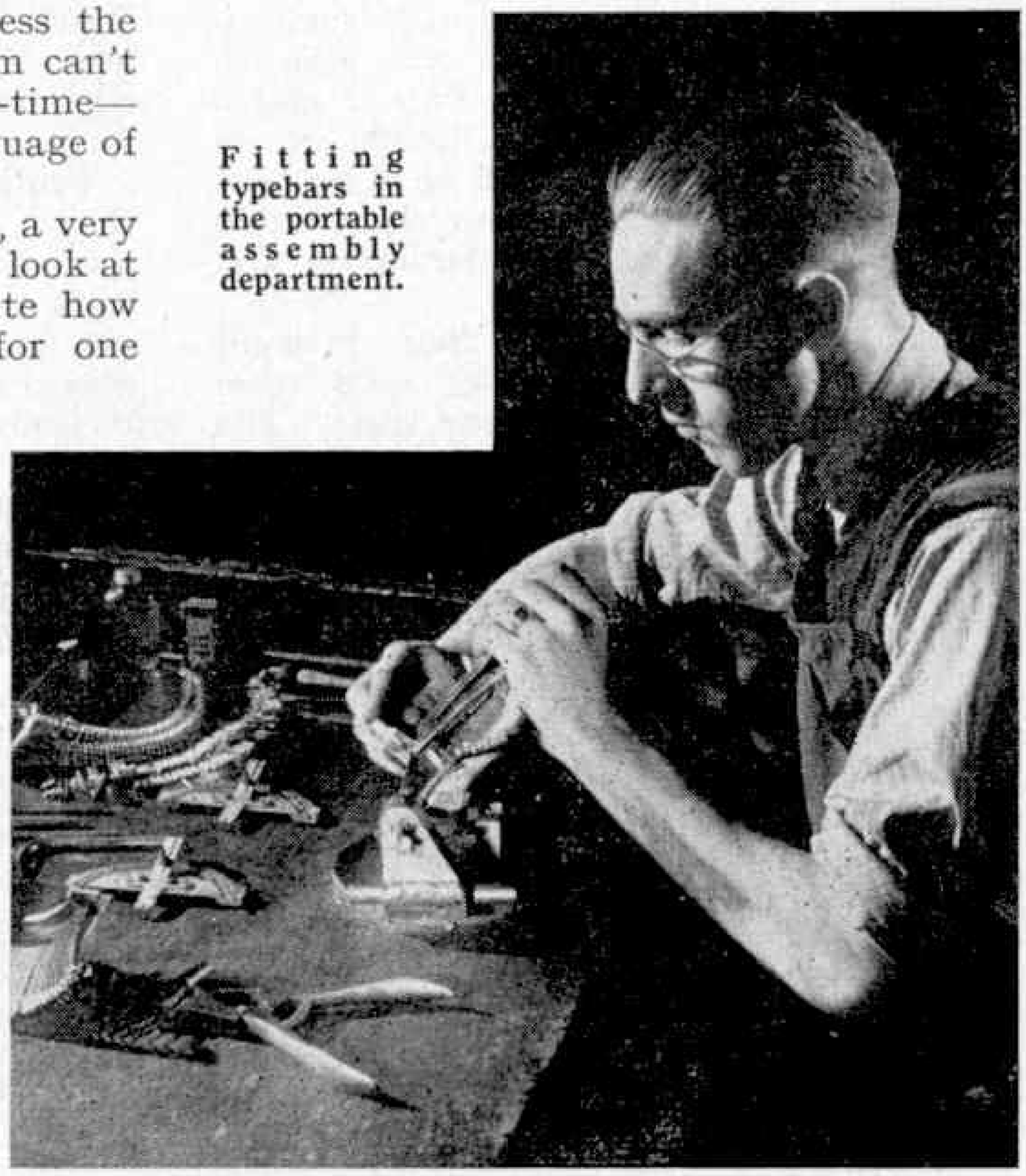
Now for the Department of Holes, a very important department, too. Take a look at any typewriter and try to estimate how many holes have to be drilled for one purpose or another. Hole for hole a typewriter puts a colander in the shade! And there's more in typewriter holes than meets the eye. Not only have they to be exactly in the right place, but many of them have to be lined with hard metal to stand up to hard wear.

A whole battery of drilling machines is called for to cope with the job of hole-making. Ordinary twist drills are not accurate enough to satisfy the makers of typewriters, so the hole is first drilled to a smaller size and a reamer used to enlarge it that odd thousandth of an inch.

Now to the business of Putting a Shine On. The best plating in the world will not cover up blemishes, so every one of the multitude of parts for immersion in the plating vats has first to be buffed and polished until you can see your face in it. The parts come from the polishing department wired up in bundles or fastened on frames by clips. First they must be degreased, which is done by a special vapour process. They are then washed in a chemical solution, after which they are given hot and cold rinses and finally etched with an acid to prepare their surfaces to receive the plating.

The parts are then lowered into the nickel plating bath for half an hour, washed and dried, and then lowered into the chrome vat for a period of about eight minutes. More washing and drying, and then away they go in their gleaming dress to the stores department, where they will remain until called into service by a "chit" from the works office.

Bogey No. 1 to any enamelling department is dust, but at the Imperial works it isn't given the chance to get up to mischief. A special air conditioning plant keeps the atmosphere perfectly clear. Furthermore, the air pressure within the department is slightly in excess of that outside, so when a door is opened the air flows outward, effectively repelling any dust from entry.



Fitting typebars in the portable assembly department.

The earliest typewriters were fitted with printer's type which, being made from lead alloy, soon proved incapable of standing up to continuous wear. The characters on an Imperial machine are made of specially hardened steel. Believe it or not, they are not cast from molten metal in a mould, but the cold, hardened steel is pressed into the matrices! This sounds an impossible operation, but under the right conditions and with enormous pressure, steel can be made to behave almost like a piece of putty.

Soldering the type blocks to the ends of the type arms means working to the finest of limits, for if one character is a shade out of alignment the defect "stands out a mile"

(Continued on page 114)

Among the Model-Builders

By "Spanner"

Claude Giasson, St. Hyacinth, Canada, who has won prizes in Meccano Competitions.

A Pre-Selector Gear-Box

Some time ago I had a visit from C. Horsford, Liverpool, a keen model-builder who delights in the construction of intricate mechanisms. He brought along to show me his latest effort, a pre-selector gear-box, which he had constructed on a large scale for the purpose of demonstrating the principles and action of such a mechanism. This month I am able to illustrate this mechanism in Figs. 1 and 2 and I hope that the few details of its main features that follow will be of interest to other readers and will spur them on to experiment with similar attractive and fascinating constructions.

The gear-box provides four forward speeds and a reverse drive, each ratio having its own planetary gear train. The gear trains for the forward speeds are similar in general arrangement, and it is proposed to describe only one of them in detail. The other three can be made in practically the same way but by altering the sizes of the gears different speed ratios can be obtained.

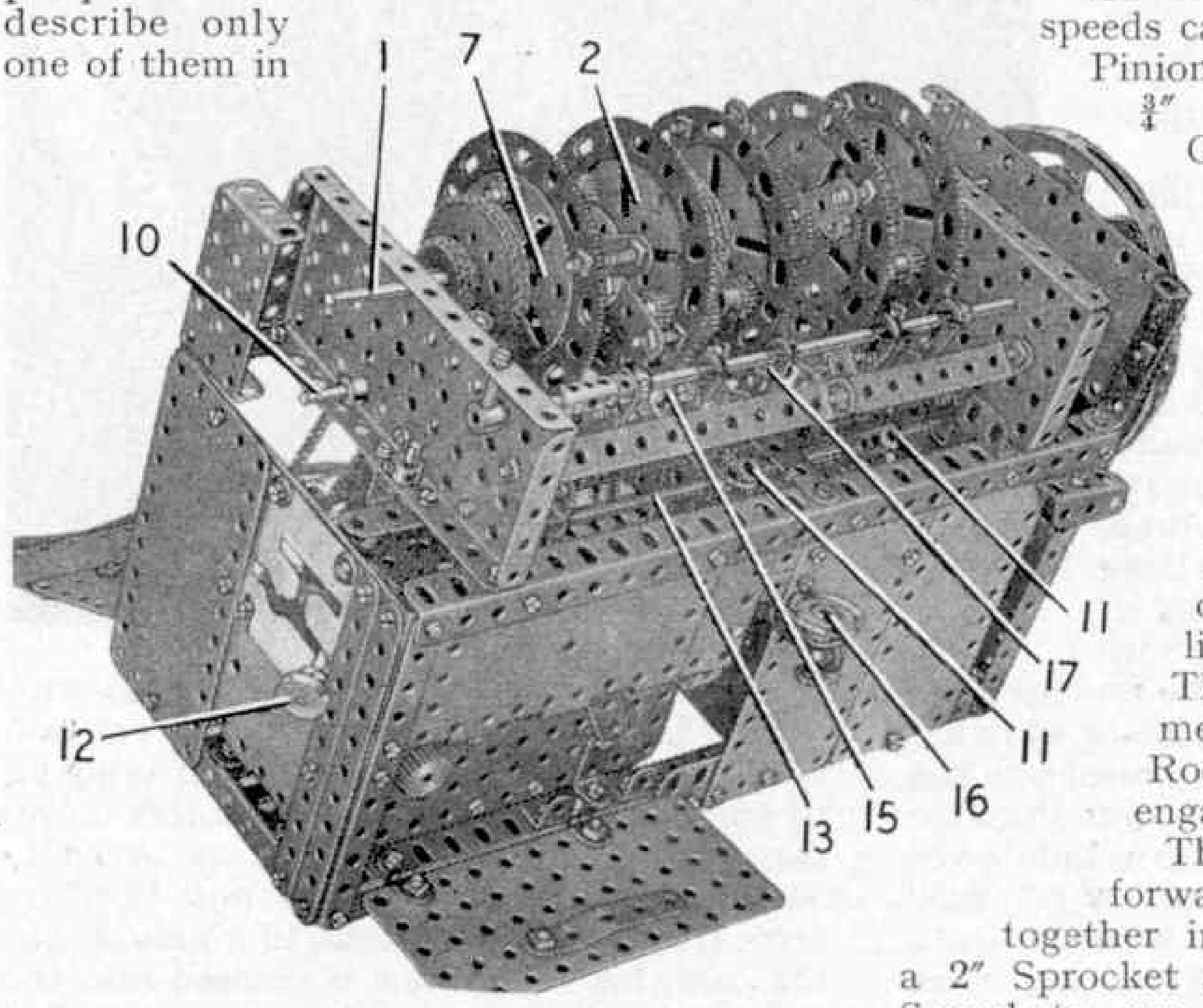


Fig. 1. The pre-selector gear-box built for demonstration purposes by C. Horsford, Liverpool.

Each of the forward gear trains consists of a Face Plate 2 freely mounted on the input shaft 1. A Gear Ring is connected to a Strip by long Bolts, and a Bush Wheel bolted centrally to the Strip serves as a bearing to support the Gear Ring on Rod 1. The Gear Ring assembly must be free to rotate on the Rod. In the gear train under consideration two 1″ Gears 3 are fixed on 1″ Rods mounted in outer, opposite holes in the Face Plate 2. The 1″ Rods are held in place by ½″ Pinions 4, which engage the Gear Ring, and the Gears 3 mesh with another 1″ Gear fixed on the Rod 1. The three other forward speeds can be obtained by using ½″ Pinions and a 57-tooth Gear, ¾″ Pinions and a 50-tooth Gear, and a 7/16″ Pinion and a 60-tooth Gear instead of the 1″ Gears mentioned in the gear train described above.

The reverse gear train 6 consists of a Face Plate 7 and a Gear Ring mounted as described previously. Four ½″ Pinions are fixed on 1″ Rods mounted in a line across the Face Plate. The inner pair of Pinions mesh with a ½″ Pinion on the Rod 1 and the outer pair engage the Gear Ring.

The Face Plates of the four forward gear trains are coupled together in pairs, each pair having a 2″ Sprocket attached to them. These Sprockets are connected by Chain to Sprockets on the output shaft 10. The reverse Face Plate 7 also is attached to a 2″ Sprocket that is connected by Chain to the output shaft.

The gear ratio required is engaged by preventing the appropriate Gear Ring from turning. A selector lever 12 is arranged to slide two Couplings 11 on a

Rod 13, so that one of these Couplings is brought in line with the appropriate Gear Ring. When the control pedal 16 is depressed, this Coupling raises one of five 3½" Strips pivoted on Rod 14, which

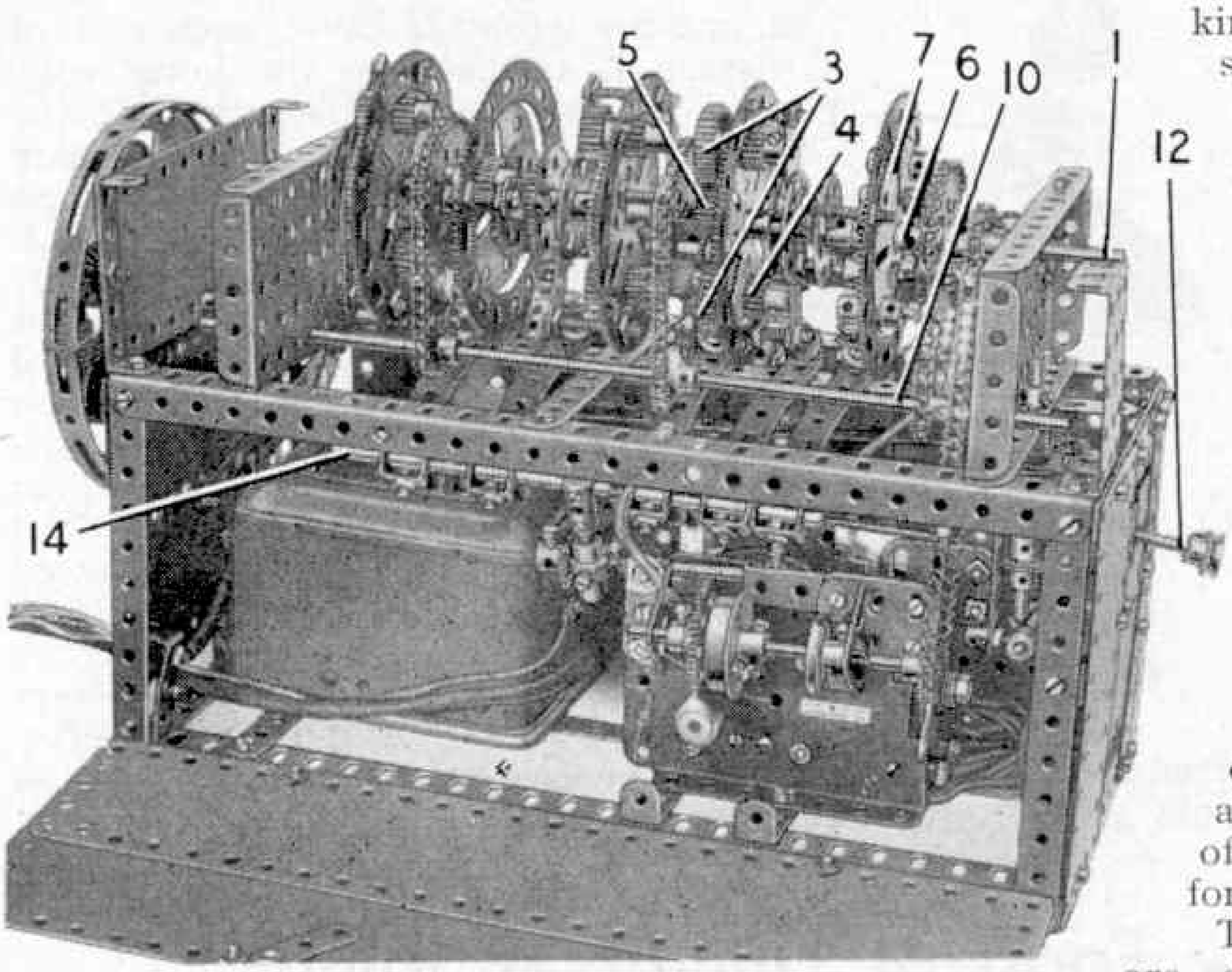


Fig. 2. The pre-selector gear-box seen from the other side, with part of the casing removed.

brings an Angle Bracket 15 into engagement with the Gear Ring and prevents it from turning. The Angle Bracket is bolted to a 1½" Strip 17.

A Useful Accessory

From time to time I have given details of hints on placing nuts and bolts in inaccessible positions in models. The most useful tool for dealing with nuts in awkward places is the Box Spanner, Part No. 34b, with which most model-builders will be familiar. Very often however, it is necessary to tighten a bolt placed in such a position that it is difficult to insert and turn the standard Screwdriver. The simple tool shown in Fig. 3 should prove very useful in these circumstances.

A Coupling 1 is fixed at one end of a long Rod, and a Rod 2 is passed through one end of the Coupling and is held in place by a Collar and a Gear. The lower end of the Rod 2 should be filed to the same shape as the blade of a screwdriver. The tool is used by holding the long Rod in one hand and inserting the filed end of the Rod 2 in the slot of the bolt to be tightened. The Gear is then turned in the same way as a Screwdriver to tighten the bolt.

Pincer Grab for Cranes

In actual practice cranes used for handling loads of particular kinds are often fitted with special equipment designed to speed up the loading and unloading operations. Among these special fittings are grabs for handling loose material in bulk, such as coal, gravel, etc., and pincer grabs to hoist loads such as blocks of stone. A simple pincer grab made with Meccano is shown in Fig. 4. The construction is easy but it will readily lift imitation stone blocks made from wood or other suitable material, and will add to the interest of a model crane designed for loads of this kind.

The two arms of the grab are each made from a 3½" Strip and a 2½" Curved Strip. End Bearings bolted to the Curved Strips carry Centre Forks that form the jaws of the grab. The arms are freely connected by a lock-nutted bolt 1. A 2½" Strip 2 is lock-nutted to the upper end of each arm, and the upper ends of these Strips are connected by a lock-nutted bolt that supports also a Fishplate 3. This Fishplate is used to attach the grab to the crane hook.

Models of grabs used for handling bulk materials such as coal, iron ore, etc., can be made quite easily with even a fairly small Outfit, and some interesting operating schemes can be devised for grab cranes. This type of grab should be made in two sections hinged together at their upper ends. The main suspension Cord should be attached

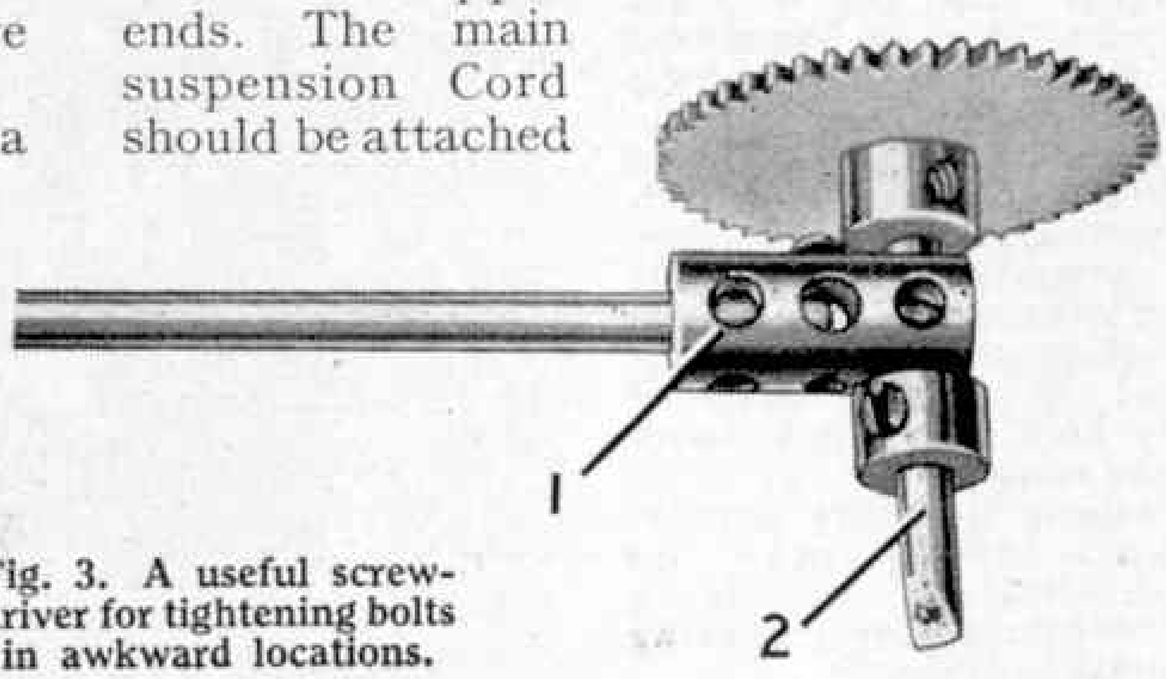


Fig. 3. A useful screwdriver for tightening bolts in awkward locations.

to a Strip or Rod arranged across the hinged joints. With this system, when the grab is hoisted, the jaws or lower edges of the two sections will snap together.

Very often in actual practice what is known as a single suspension system is used. With this arrangement a single rope serves not only to support the grab, but by an ingenious system of trip levers the rope controls the opening and closing of the grab jaws.

The single suspension system is interesting to build and to operate, but the quantity and range of the parts needed to build a mechanism of this kind make it outside the scope of a small Outfit owner. Fortunately it is possible to operate a simple grab quite easily and effectively without using a large number of parts. An extra length of Cord is fastened to the same winding shaft as the main hoisting Cord. The second Cord is taken over a Pulley at the jib head, and is tied to the centre of another piece of Cord, each end of which is fastened to the lower edge of one section of the grab. If the two Cords tied to the winding shaft are wound at the same time, the grab remains closed, but if the second Cord is made shorter than the first it opens the jaws of the grab. All you need to do to operate the grab is to pass the second Cord over a Pulley placed at one end of a lever pivoted in the crane cab. When the lever is moved the Pulley depresses the second Cord and by reducing its effective length opens the grab for unloading.

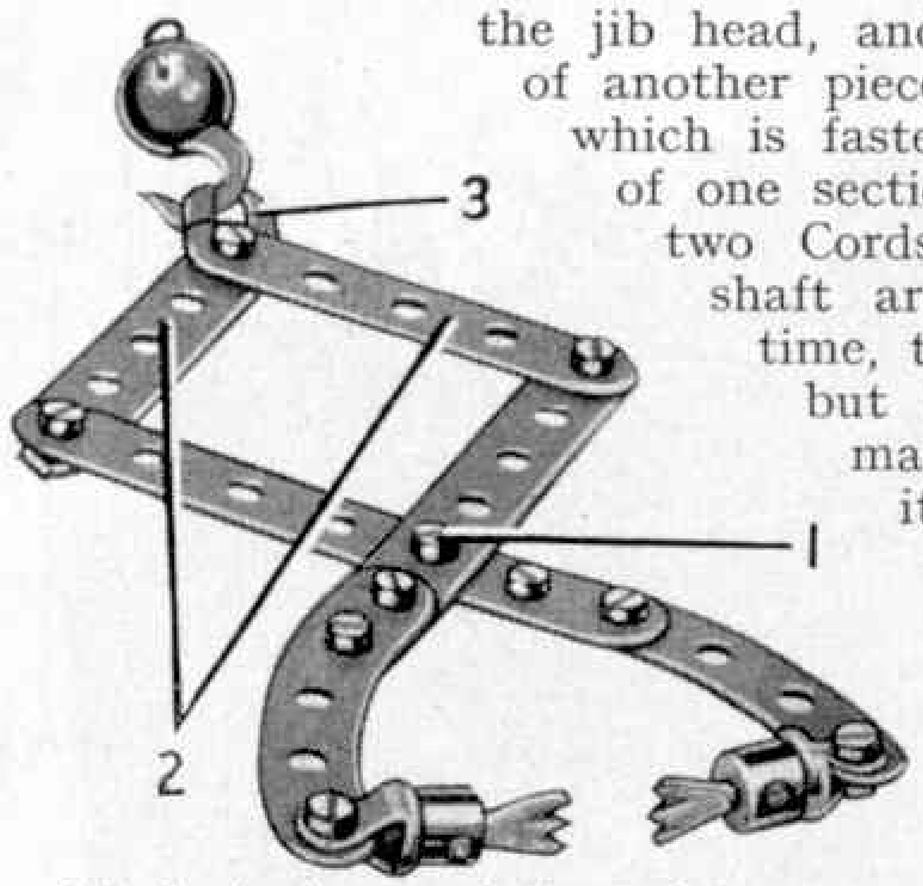


Fig. 4. A pincer grab for model cranes.

A New Form of Universal Joint

The illustration below shows a new type of universal joint invented by M. Kremer, Luxembourg. It consists essentially of two cogged wheels the teeth of which are of a spherical form, each wheel in appearance looking like half an orange sliced into sections. The cogs are mounted on shafts supported in a "hinged" framework, the result of this arrangement being that the two shafts can be moved through a full 360 degrees without interfering with the meshing of the cogs they support. It will be seen therefore that if one of the shafts is driven the cogs will transmit the drive to the other shaft irrespective of the angle between the two shafts. The method of "hinging" the framework can be seen in the illustration.

It is interesting to note that in his initial experiments the inventor used Meccano to help him in designing a suitable framework for the gearing, thus adding a still further example to the already long list of cases in which Meccano has proved of practical use to designers and inventors.

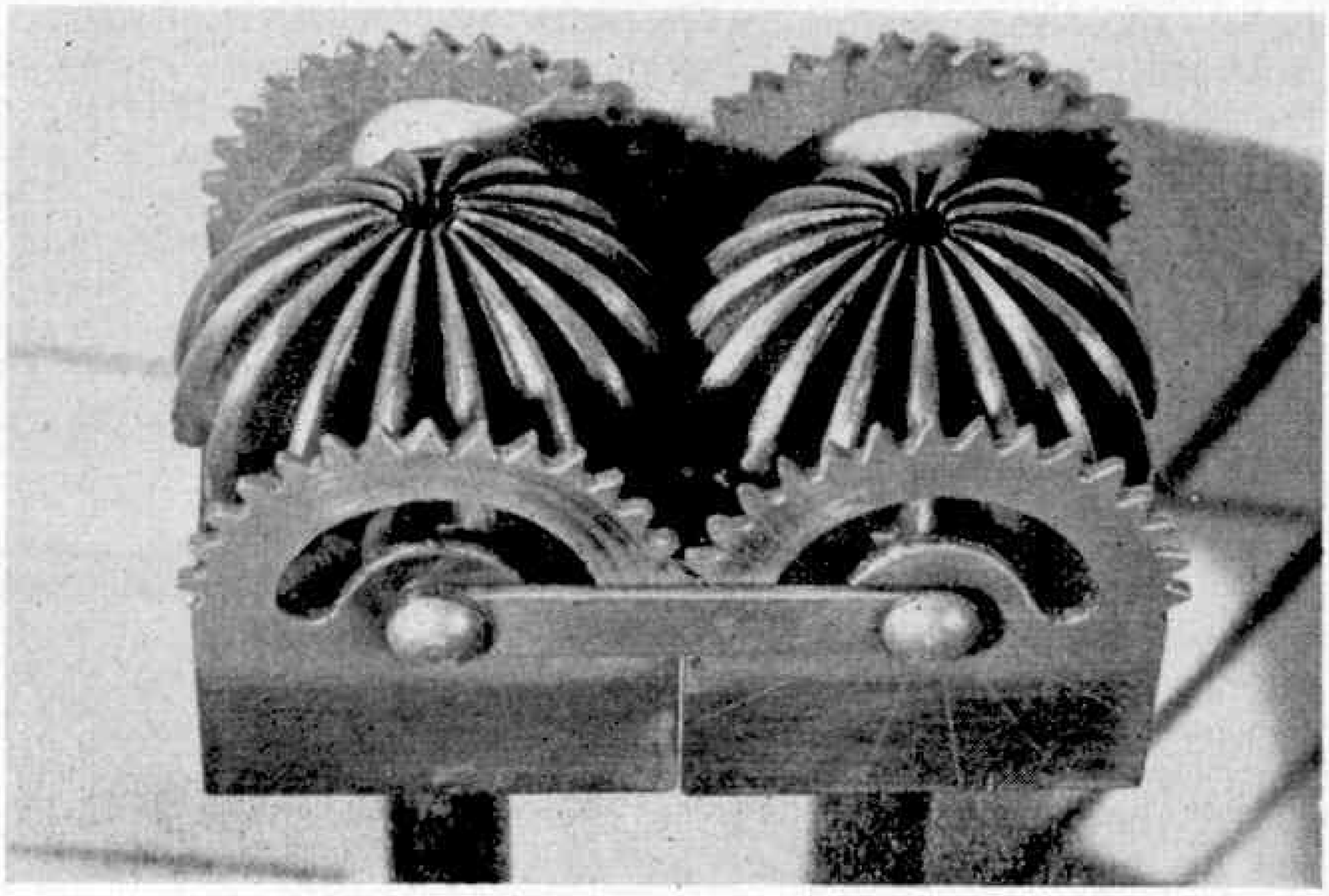
The new universal coupling permits a power drive through much greater angles than is possible with the more conventional types of coupling and eliminates the need for flexible shafts of any kind. Also, it is much more compact.

Among its many possible applications may be mentioned its use in a screwdriver for working "around corners."

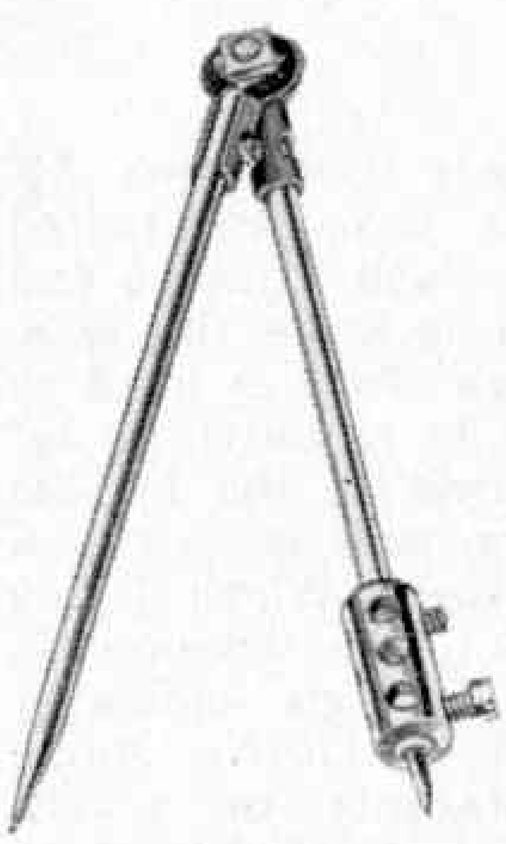
It has applications in the aircraft and motor car industries and also in various forms of machine tools.

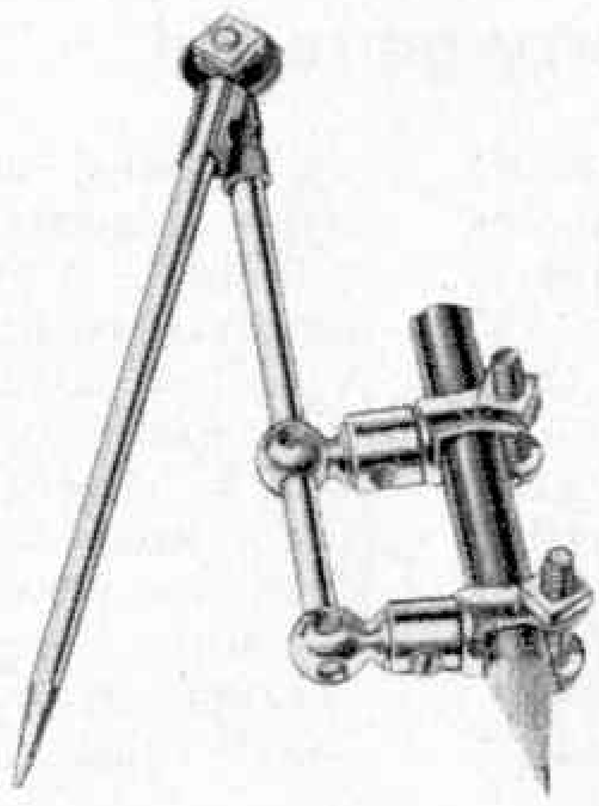
One particular and rather interesting application that has been suggested is in drilling teeth! We all know the imposing form that the dentist's drill now takes. A Kremer joint that only needs to be adjusted in one direction is said to be very suitable for incorporation in a more compact form of drill.

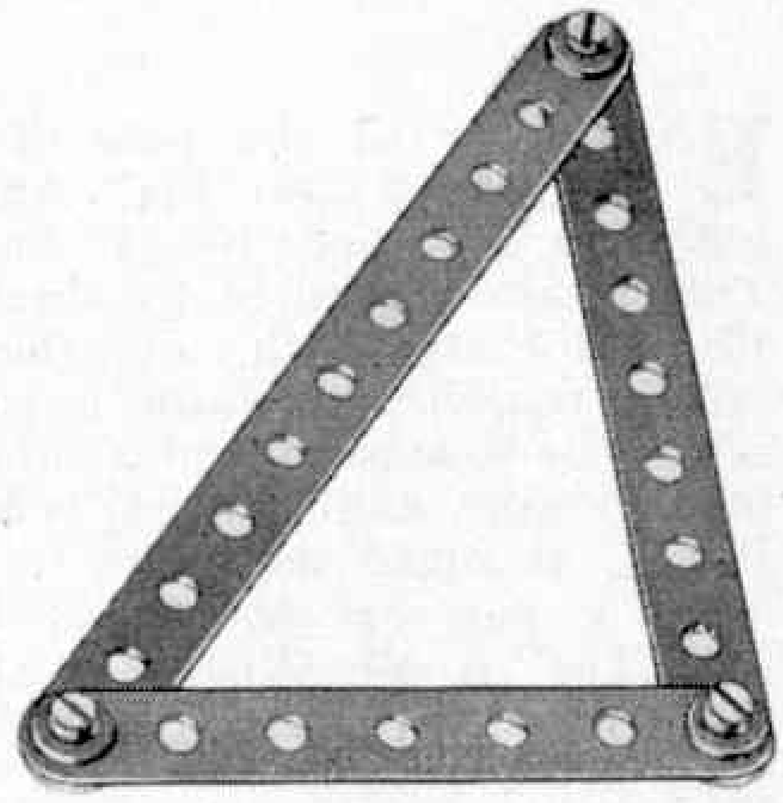
Below is a reproduction of the Kremer joint, a novel form of universal joint for which many uses have been suggested.



Meccano to the Rescue!







MECCANO is a hobby for boys, a world-famous one that provides them with a fascinating and instructive pastime. It is truly engineering in miniature, as well as a wonderful plaything, and because of that inventors and designers have used it in working out their ideas and in showing to others just what they have achieved.

But the value of Meccano does not end there. Almost every day brings some new story of its use, often in a surprising way. This is illustrated by the following story, told to us by Mrs. G. Watson, London S.E.22, who has turned Meccano to account in the kitchen!

Mrs. Watson has two boys, both keen Meccano enthusiasts, and for a long time their Meccano was regarded as a hobby in the conventional way. They started with a fairly small Outfit and gradually added Accessory Outfits, parts, motors, etc., until they had built up a large collection. Of course the interest in Meccano was not confined to the boys! As usual Father took a hand, on occasions monopolising the Outfit when a particularly attractive model took his eye, and even Mrs. Watson was drawn from the role of spectator into an active model-builder. So Meccano became a well-established feature of the Watson household, but continued to be regarded as a hobby until one day a domestic crisis spotlighted more serious uses for it.

Here is a story of Meccano in the home. One section of it concerns homework, a painful but necessary pursuit, and at the head of the page are drawing instruments built of Meccano when the normal ones were not available.

Everyone must be familiar with the emergencies that arise from time to time even in the best regulated households. Sometimes it seems that the malicious little folk, known familiarly to members of the Royal Air Force as gremlins, take a mischievous delight in upsetting important occasions.

The crisis in the Watson household was particularly acute, for it was connected with the all-important matter of FOOD. The dish in question was a lemon pie, and the trouble arose through the preparation of white of egg for a meringue. Everything was ready but alas, the egg whisk was missing, hidden so well by the gremlins that the most exhaustive search failed to bring it to light.

Just when it seemed that the lemon pie was doomed, in spite of laborious stirring with a fork, one of the boys had a flash of real inspiration. Out came the Meccano Outfit, and in a few seconds a Fan was fitted to a Rod, which was passed through a hole in an old pan lid and coupled to an Electric Motor. Within seconds the meringue was ready and the situation was saved.

The next crisis was just as alarming and once again Meccano provided a quite effective solution. This time one of the boys forgot to bring home from school a pair of compasses that he needed for his homework. Every schoolboy knows the dire consequences of turning up the next day without the previous night's homework, properly done. It was doubtful if the excuse would be accepted, and in any case there was sure to be a reproof for forgetfulness. Teachers are apt to be suspicious of homework excuses!

The problem was acute, but once again Meccano saved the day. A pair of compasses

(Continued on page 114)

New Meccano Model

Merry-go-round

EACH side of the base of the model consists of two 12½″ Angle Girders joined at their ends by 1½″ Angle Girders. The sides are filled in by three 5½″ × 1½″ Flexible Plates each, and they are then bolted together to form a square. The top of the base is filled in by four 12½″ × 2½″ Strip Plates and four 4½″ × 2½″ Flexible Plates, arranged as shown in Fig. 3 to leave a gap 3½″ square in the centre. Two 12½″ Angle Girders 1 are bolted underneath the top, and along one side four 12½″ Angle Girders are arranged to form steps.

The centre column consists of four 7½″ Angle Girders connected at the top by four 2½″ Strips and at their lower ends by four 2½″ Angle Girders 2. Each side of the column is filled in by two 4½″ × 2½″ Flexible Plates, and is strengthened at the centre by two 2½″ Strips. A 6″ Circular Plate 3 is attached to the top of the column by Angle Brackets, and a 1½″ Contrate is fixed to the centre of the Circular Plate by four ⅜″ Bolts. The Contrate is spaced from the Circular Plate by four Washers on each Bolt. A 5½″ × 3½″ Flat Plate is bolted to the Angle Girders 2, and this Plate is used to attach the column centrally to the base.

The rim of the rotating canopy consists of nine 4½″ × 2½″ Flexible Plates bolted end to end and strengthened along their lower edges by 4½″ Strips. The upper edge of the canopy is completed by nine 4″ Stepped Curved Strips joined by 1″ Corner Brackets and bolted to the Plates.

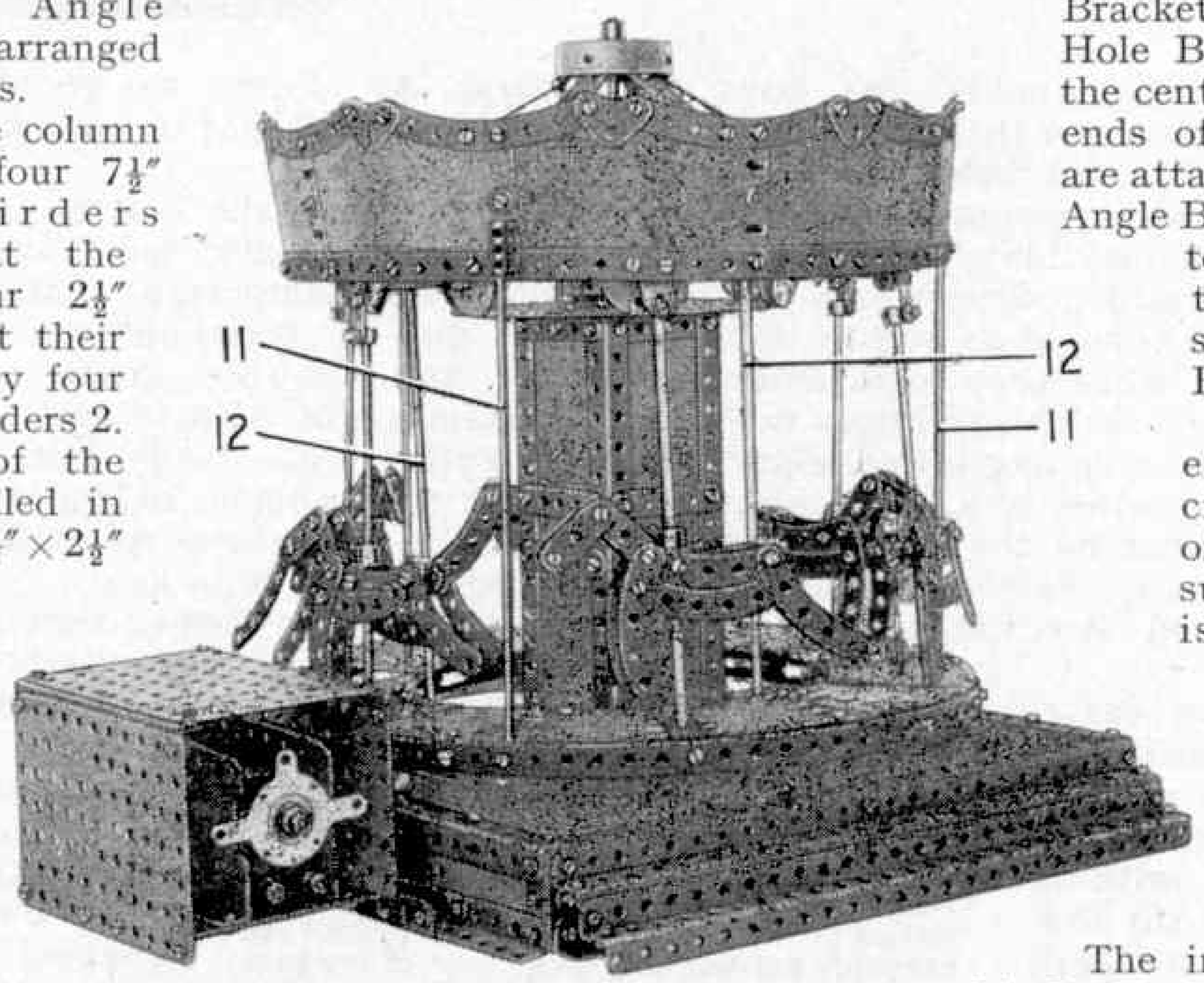


Fig. 1. A hobby horse Merry-go-Round, in which the horses are made to "leap" by a crank motion.

Six spokes, each made from two 5½″ Strips placed face to face, are bolted radially to a Six Hole Bush Wheel 4 and are attached to the rim by Angle Brackets. A 2½″ × 1″ Double Angle Strip is fixed to each spoke and in it is mounted a 4½″ Rod 5. The Rod is held in the Double Angle Strip by Collars, and it carries a ¾″ Pinion 6, a 1⅛″ Flanged Wheel 7 and a Short Coupling 8. The canopy is completed by six 5½″ Strips, indicated at 9, and connected by Obtuse Angle Brackets to a Six Hole Bush Wheel at the centre. The outer ends of these Strips are attached to 1″ × ½″ Angle Brackets bolted to the rim of the canopy as shown in Fig. 2.

The outer edge of the circular floor of the rotating superstructure is made by curving a 3½″ and three 12½″ Strips and bolting them end to end. The inner edge of this floor consists of three Formed Slotted Strips and three 5½″ Slotted Strips, and is connected to the outer edge by six 2½″ × ½″ Double Angle Strips 10. The floor between each pair of Double Angle Strips is filled in by two 2½″ × 2½″ Flexible Plates and a 2½″ × 1½″ Triangular Flexible Plate, bolted together and attached to Angle Brackets.

The canopy and the circular floor are connected by three outer 8″ Rods 11 and three inner made-up rods 12. Each made-up rod consists of two 5″ Rods joined by a Rod Connector. The Rods 11 are held in Couplings attached by bolts to the canopy, and are fixed in Collars screwed on to bolts passed through the outer edge of the circular floor. Rods 12 are fixed in Collars attached by nuts and bolts to the Strips 9, and in Collars

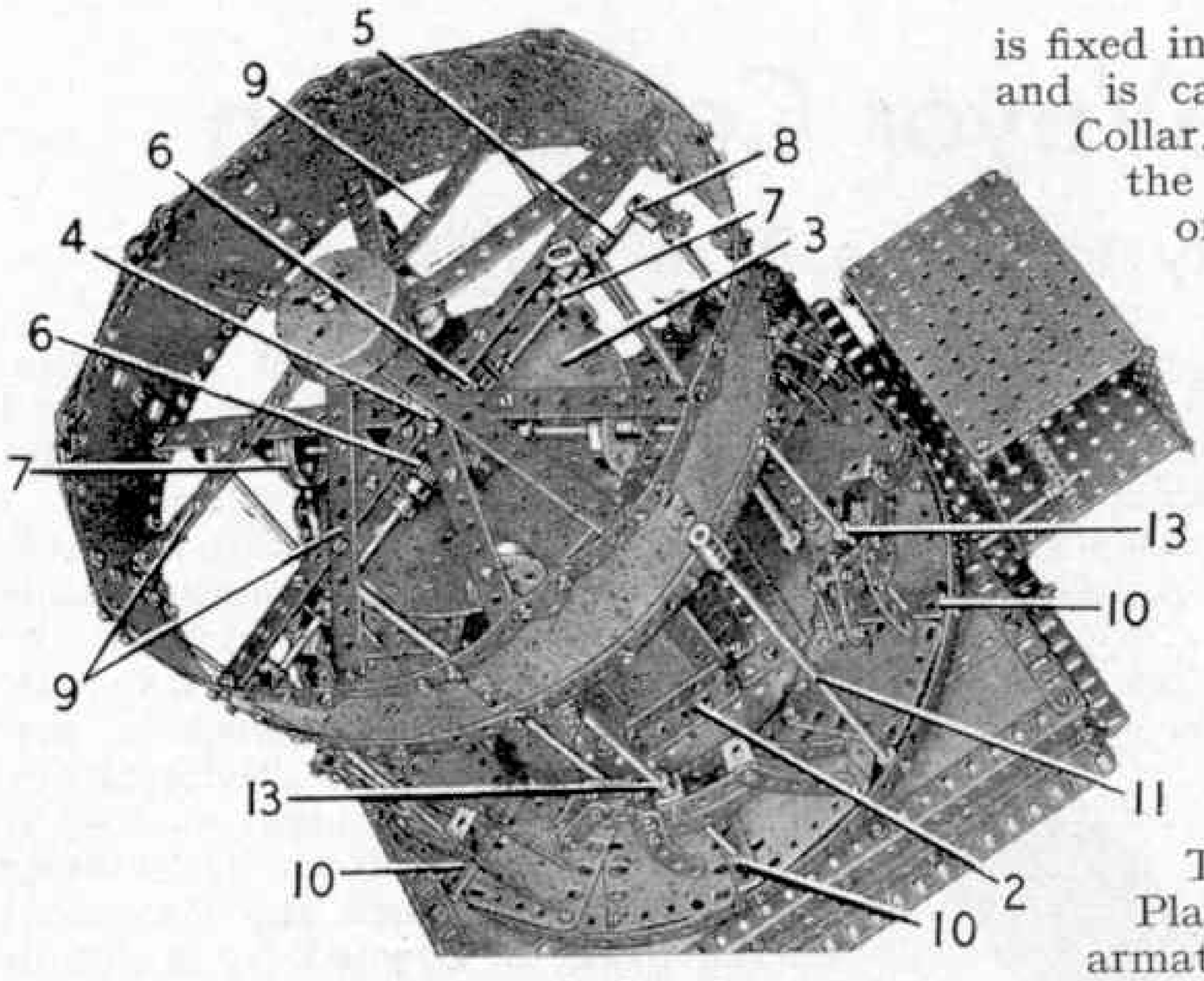


Fig. 2. Details of the crank mechanism that operates the leaping motion of the horses.

screwed on to bolts passed through the inner edge of the circular floor.

The six horses and their operating mechanisms are identical. The body of each horse consists of four $2\frac{1}{2}$" Curved Strips and the front and rear legs are further $2\frac{1}{2}$" Curved Strips. The neck and head are made from $1\frac{1}{2}$" Strips as shown. The two $1\frac{1}{2}$" Strips forming the head are connected at the front by a $\frac{3}{8}$" Bolt, with a Collar on the Bolt between the Strips. The sides of the body are connected by a Double Bracket and a Large Fork Piece 13.

Each horse is supported by a rod made from a 4" and a 3" Rod joined by a Rod Connector and fixed in the Fork Piece 13. This rod is free to slide in one of the Double Angle Strips 10, and it carries at its upper end a Collar. A bolt fitted with a nut is passed through a Fishplate and is screwed into the Collar. The nut is then tightened to fix the Fishplate and the Collar together, but the bolt must be at the lower end of the slotted hole in the Fishplate. A bolt is passed through each Fishplate, is fitted with a nut and is screwed tightly into one of the Short Couplings 8. The Fishplate must pivot freely on the bolt.

The main driving shaft is made from an $11\frac{1}{2}$" and a 2" Rod joined by a Coupling. It is fixed in the Bush Wheels of the canopy and is capped by a Boiler End and a Collar. The shaft passes freely through the boss of the Contrate at the top of the column and through the centre hole of the $5\frac{1}{2}" \times 3\frac{1}{2}"$ Flat Plate. The lower end of the shaft is fitted with a $3\frac{1}{2}$" Gear 14. The Pinions 6 mesh with the $1\frac{1}{2}$" Contrate, and the Flanged Wheels 7 are free to run round the edge of the Circular Plate 3.

The housing for the E20R Electric Motor consists of two $3\frac{1}{2}" \times 2\frac{1}{2}"$ Flanged Plates connected by $5\frac{1}{2}" \times 3\frac{1}{2}"$ Flat Plates bolted to their flanges. The Motor is fixed to the Flanged Plates, and a $\frac{1}{2}$" Pinion on the armature shaft drives a 57-tooth Gear on a $2\frac{1}{2}$" Rod 15. A $\frac{1}{2}$" Pinion on Rod 15 engages a 57-tooth Gear on a $2\frac{1}{2}$" Rod that carries also a 1" Sprocket 16. A $7\frac{1}{2}$" Angle Girder 17 is bolted to one side of the housing, and is fixed to Double Brackets bolted to the base. A cover over the Motor is provided by a $5\frac{1}{2}" \times 3\frac{1}{2}"$ Flat Plate supported by $5\frac{1}{2}$" Angle Girders.

The Sprocket 16 is connected by Chain to a 1" Sprocket on an $11\frac{1}{2}$" Rod 18. This Rod is supported in the Girders 1 and in the sides of the base and the Motor housing. A Worm on Rod 18 drives the $3\frac{1}{2}$" Gear 14.

Parts required for the Merry-go-round: 3 of No. 1; 18 of No. 2; 9 of No. 2a; 1 of No. 3; 12 of No. 5; 24 of No. 6a; 14 of No. 8; 5 of No. 8b; 2 of No. 9; 4 of No. 9e; 4 of No. 9f; 6 of No. 10; 8 of No. 11; 28 of No. 12; 6 of No. 12b; 6 of No. 12c;

(*Continued on page 114*)

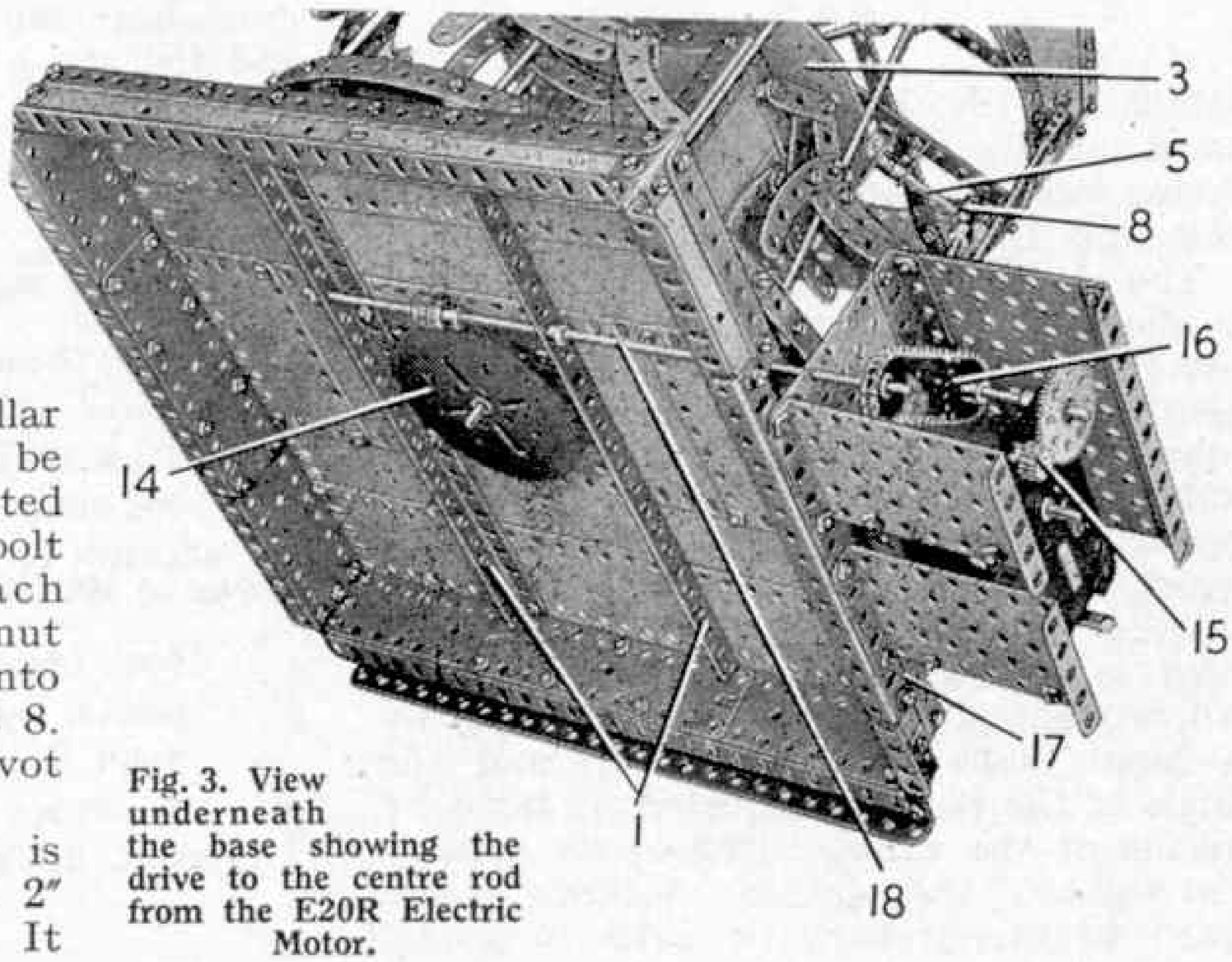


Fig. 3. View underneath the base showing the drive to the centre rod from the E20R Electric Motor.

The LoadaVeyor Competition

A Last Opportunity to Win a Prize in This Contest

THE LoadaVeyor Competition announced in the November 1955 *M.M.*, closes for entries at the end of this month, and this is the last opportunity we shall have to remind intending competitors to prepare and submit their entries.

In this Contest fine Cash Prizes are offered for the best Meccano models of The LoadaVeyor, a sturdy mobile conveyor manufactured by Messrs. J. Collis and Sons Ltd., London. The LoadaVeyor is shown in the accompanying illustration, and full details of the Prizes are given in the panel at the foot of the page. These Prizes will be awarded by Messrs. J. Collis and Sons Ltd., and Meccano Ltd. jointly.

The LoadaVeyor has been described in detail in previous issues, but a brief summary of its main features may be helpful. Essentially it consists of a continuous motor-driven belt running on rollers mounted in a metal boom. The boom is pivoted near its heavier end, which carries the driving motor, on a tubular steel cradle, and the cradle in turn is pivoted on a wheeled chassis. Adjustment of the cradle is carried out by a small Collis Hydraulic Unit, and the angle of the boom is adjusted by hand by means of the tubular framework seen at the right of the picture. A screw clamp fixed to this framework slides in guides attached to the underside of the boom, and enables it to be locked in any required position within minimum and maximum limits.

The motor that drives the belt is mounted inside a casing at one end of the boom. The motor transmits its drive by sprockets and chain to the belt driving drum. The latter is mounted so that it can slide up and down to facilitate tensioning of the belt and movement of the drum is effected by a simple screw and lock-nut.

The chassis runs on rubber-tyred castors at the front and rubber-tyred ball-bearing wheels at the rear, and is fitted with screw-down sprags for levelling on uneven floors.

Model-builders will not be able to reproduce the hydraulic mechanism in Meccano, and they are free to substitute any other kind of mechanism they can devise. The conveyor belt can be made from cloth, stout paper or other suitable material.

Entries must be addressed to *The LoadaVeyor Competition, Meccano Ltd., Binns Road, Liverpool 13,* and must reach this Office not later than 29th February. The actual model must not be sent. All we require are photographs or drawings, each of which must bear the sender's name and address and the age he will be on 29th February next.

THE PRIZES

SECTION A. (Competitors under 15 years of age on 29th February, 1956):

	£	s.	d.
First, Cheque for	10	0	0
Second, Cheque for	6	0	0
Third, Cheque for	4	0	0
Ten Prizes, each of a Cheque for	2	0	0

SECTION B. (Competitors 15 years of age or over on 29th February, 1956):

	£	s.	d.
First, Cheque for	15	0	0
Second, Cheque for	8	0	0
Third, Cheque for	5	0	0
Ten Prizes, each of a Cheque for	3	0	0

CLOSING DATE FOR ENTRIES—
29th FEBRUARY, 1956

Club and Branch News

WITH THE SECRETARY

MERIT MEDALLIONS

This is the month of the year when I publish my annual list of Club members who have been awarded the Merit Medallion, the official recognition of good work by members for their Club and for the Guild. The current list, given below, contains more names than that of a year ago, and I congratulate all the members concerned on the distinction that they have gained and which, in every case, has been thoroughly earned.

Here is the list of members awarded Merit Medallions during the past twelve months: CHRISTCHURCH (NEW ZEALAND) M.C.—Saunders, C. E.; Sherwood, W.; Stanton, G. CONSETT AND DISTRICT M.C.—Ayton, R.; Barron, J. N.; Pattinson, K.; Ward, B. EXETER M.C.—Baker, R.; Barry, J.; Bastin, M. J.; Bradford, B.; Cook, R.; Gorfin, K.; Incleton, D.; King, C.; Krogmann, P.; Russell, B. FREMANTLE DISTRICT (WESTERN AUSTRALIA) M.C.— Robertson, R.; Young, G. LAUNCESTON M.C. — Bawden, R.; Fry, M.; Gynn, A.; Hillman, T.; Thorne, R. MAYLANDS (WESTERN AUSTRALIA) M.C.—Duffy, K.; Hogan, B.; Horrocks, I.; Parker, M.; Pekin, R.; Peterson, L.; Strang, R.; Westlund, M. MILE END (PORTSMOUTH) M.C.—Firman, A.; Hudson, R. STRENSALL (YORK) M.C.—Rowntree, C.; Ward, A. ST. THOMAS (EXETER) M.C.—Drinnan, D.; Madge, B.; Madge, C.; Morgan, D. H.; Morgan, R.

CLUB NOTES

BURY GRAMMAR SCHOOL M.C.—Meetings are well attended, and model-building is being continued with much enthusiasm. Hornby-Dublo operations also maintain their popularity. It is hoped to extend the Club layout, and space has been made available for Hornby Gauge 0 operations. Club roll: 22. *Secretary:* I. A. Stockley, 22 Benson Street, Bury, Lancashire.

LAUNCESTON M.C.—The subject of a Meccano Model-building competition was *Anything with Wheels*, and the winning entry was a model Austin A90 car. The aero-modellers have had a competition for the best solid model. A linoleum track for model jet car racing has been laid, and has proved very successful. A session of *Twenty Questions* was greatly enjoyed. Club roll: 45. *Secretary:* R. J. Keast, Lytham, Dunheved Road, Launceston, Cornwall.

EXETER M.C.—A detailed model fort constructed by a member was a great attraction. A model oil derrick, with a motor-driven drill, has been completed by the Secretary. It is hoped to start a Stamp Section, as many of the younger members are keen stamp collectors. Club roll: 18. *Secretary:* C. Willis, 23 Hanover Road, Heavitree, Exeter.

INDIA

KOTA M.C.—The Club held a tea party to celebrate the completion of a very successful first year of operations. An Exhibition of Meccano models held soon afterwards aroused much interest and was visited by many important local people. Six members including the Secretary, visited Delhi, 300 miles from Kota, to see the Indian Industrial Fair, and on their return gave an account of the Fair to the other members of the Club. Club roll: 10. *Secretary:* Hari S. Chablani, House No. 4/302, Kota (Rajasthan), India.

SOUTH AFRICA

CAPE PENINSULA M.C.—The Hobbies Fair held in the Goodwood Show Ground Hall was very successful, and the Club were congratulated on their fine display of models. Two Meccano robots that walked across the floor were a great attraction. Club roll: 27. *Secretary:* K. M. Leibbrandt, "Eastbourne", Wargrave Road, Kenilworth, Cape Town, South Africa.

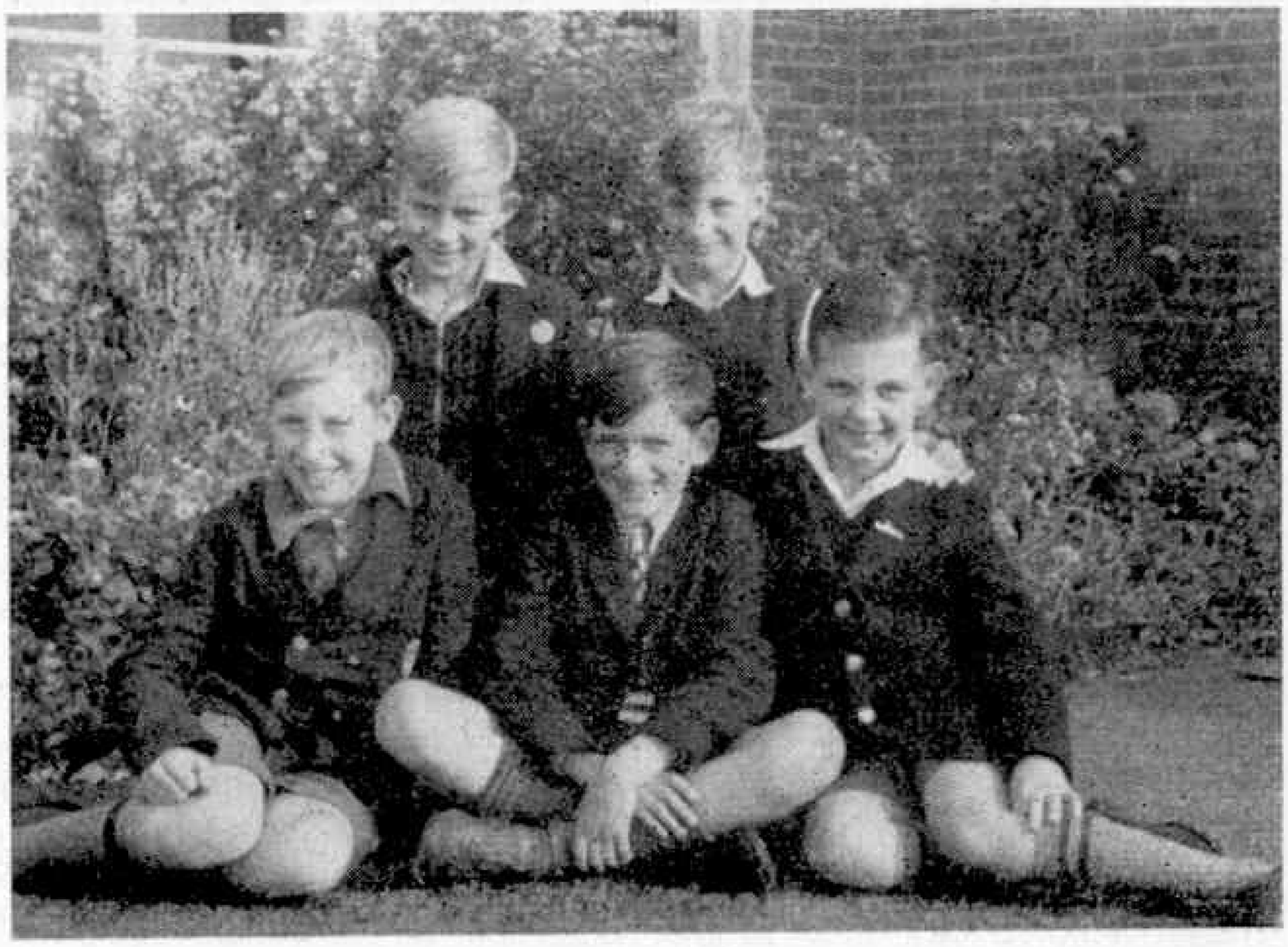
AUSTRALIA

FREMANTLE AND DISTRICT M.C.—Model-building activity has been well maintained, and two new members have made good progress with their models. Plans for completing the Club year include a model-building competition between two teams, a play by Les Smith, a games night, and a visit to the Maylands M.C. in connection with which a table tennis tournament between the two Clubs is being arranged. *Secretary:* T. Howe, 9 Phipps Street, Bicton, Western Australia.

BRANCH NEWS

NEWPORT (I.o.W.) CHURCH OF ENGLAND BOYS SCHOOL—A new baseboard for the Branch layout has been prepared and the track put down. Scenic effects which are planned include a model town and village and a model dockyard. *Secretary:* J. Richardson, 78 White Pit Lane, Newport, Isle of Wight.

ABBEYFIELD ROAD (SHEFFIELD)—The Exhibition was a great success. A Branch library has been organised, and already there is a good selection of books. A recruiting campaign for new members has begun. *Secretary:* R. North, 132 Abbeyfield Road, Sheffield 4.



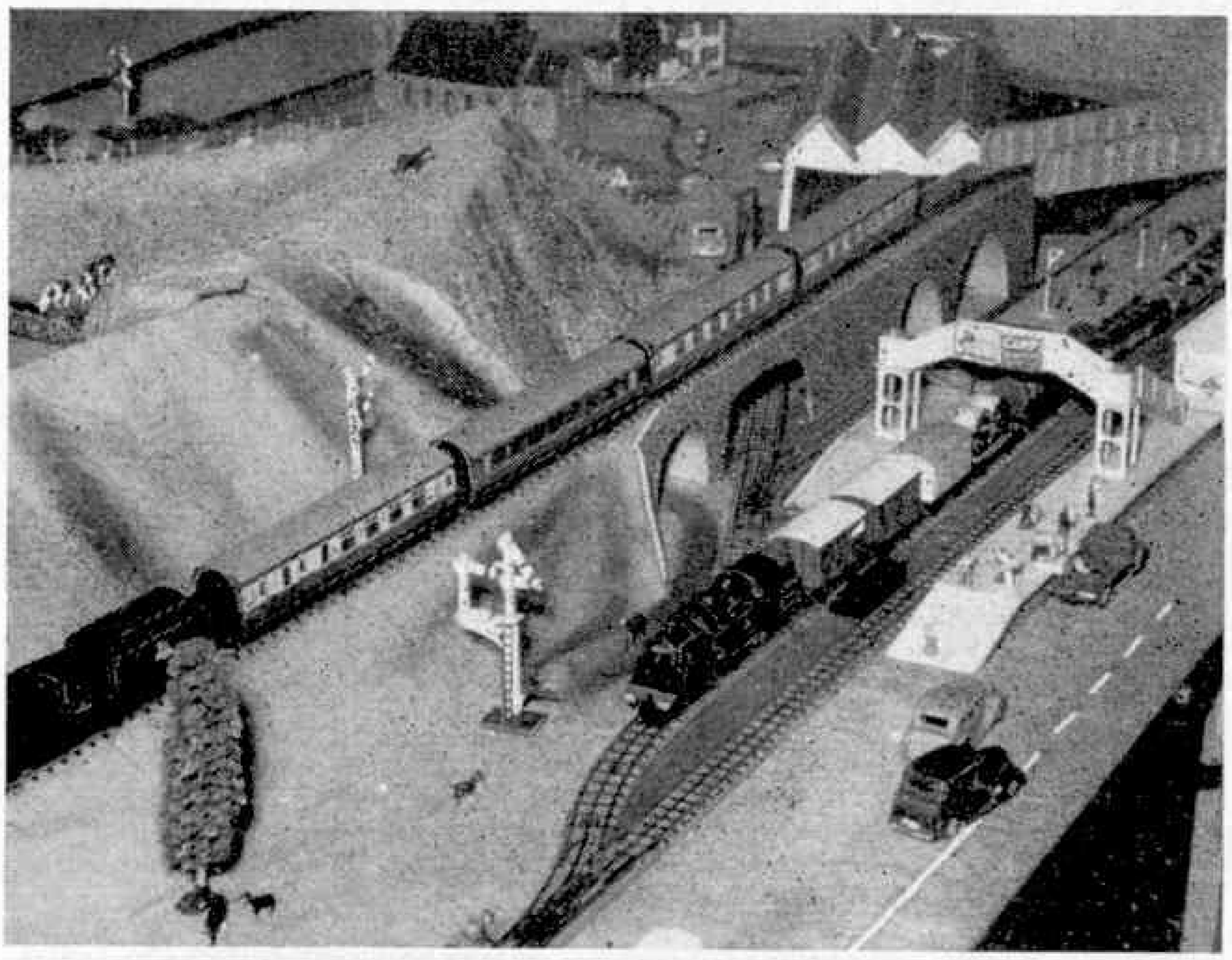
The committee of the Newport Church of England Boys' School Branch in happy mood. This enthusiastic Branch in the Isle of Wight has made excellent progress since its incorporation with the Hornby Railway Company almost two years ago.

HORNBY RAILWAY COMPANY

By the Secretary

The Greystone Railway

A LITTLE while ago I visited the *Greystone Railway*, a Hornby-Dublo layout so named because it serves, primarily, the miniature town of *Greystone*. This is situated on a raised baseboard in a room that the joint owners, Alan and Patrick Howard, of Birkenhead, are fortunate in being able to devote to their hobby. Not only is the railway in the room, but there is also a work bench with the tools and materials, glues and paint indispensable to those who supplement the use of standard miniature railway products by the construction of lineside features of various kinds. The room therefore is a self-contained railway kingdom and how the advantages that it bestows have been put to good use is evident in the pictures on this and the following page.



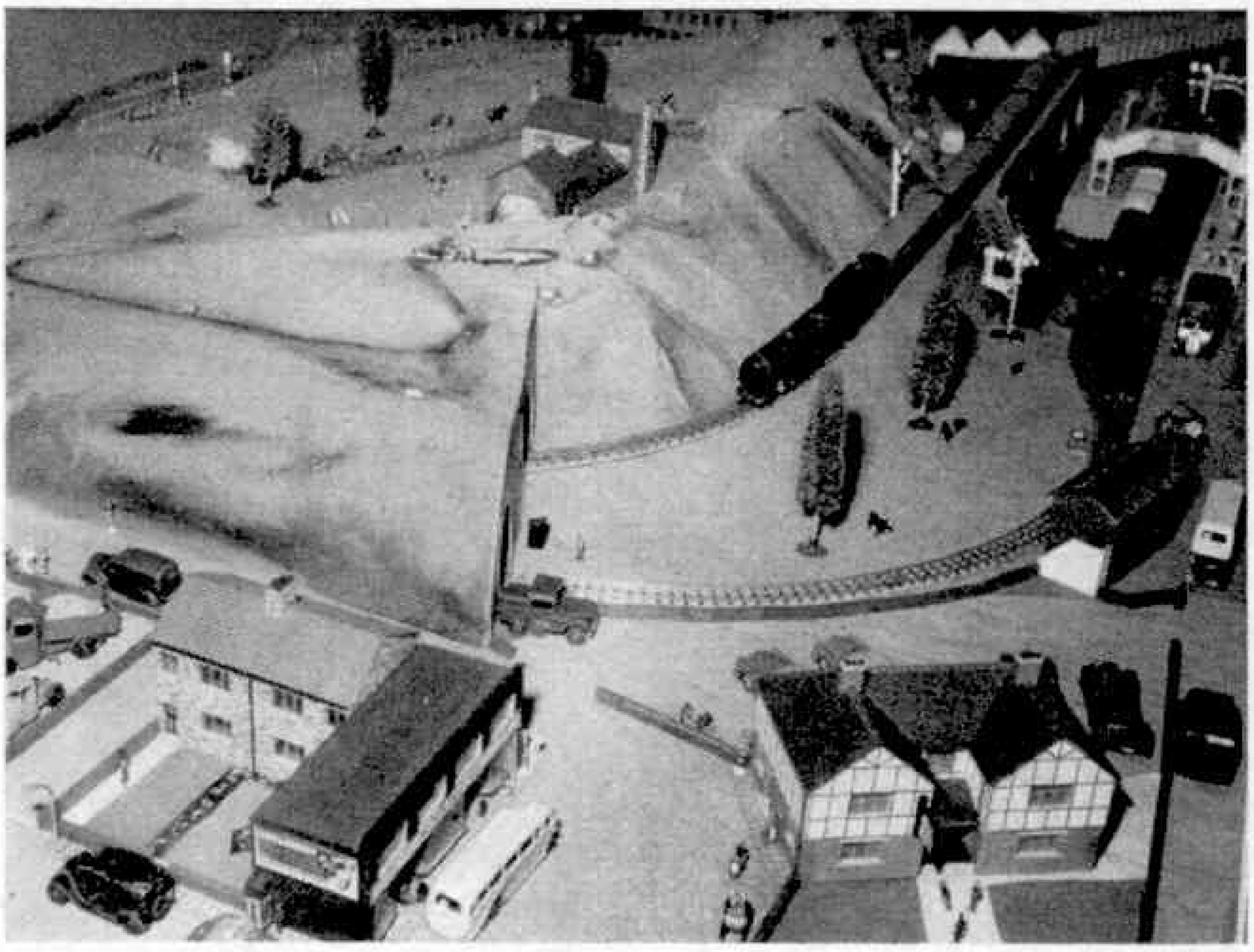
Part of the Greystone Railway referred to in this article. Photographs are by Mr. A. L. McEntyre.

Like most Hornby-Dublo or other miniature railways, the *Greystone Railway* did not come into being suddenly. Rather has it been built up in stages, with different plans favoured from time to time. It has been modified here and extended there until the present system was evolved. Even in the earlier stages of layout development, the arrangement of the countryside kept pace with the rails so that, necessarily, as the course of the latter has been changed, so also have corresponding alterations been made in the setting of the line. Whether the existing scheme will remain permanent is not known at the moment, but certainly I found all the features of the present line of tremendous interest, giving as they do evidence of careful thought and no less careful workmanship.

Greystone Station has three platform faces, the platforms being staggered slightly in relation to one another, owing to the situation of loop connections and a diagonal track leading to an engine shed. There a *Duchess of Montrose*, a 2–6–4 Tank and an 0–6–2 Tank rest when their work is done. You can see the arrangement quite clearly in the illustration on this page.

The *Greystone Railway* engineers have been enterprising and have managed quite successfully to include gradients. These have had to be situated partly on curves, and they call for careful alignment and maintenance and for skilled engine driving. A climbing section is shown prominently in the third illustration. It leads to a high level length that crosses diagonally above one end of *Greystone* station on a plate girder bridge of balsa wood, and then runs along a wood and brick paper viaduct parallel to the station track. On the opposite side of the layout to *Greystone* is *Chippendale Halt*, a small platform greatly appreciated, I was glad to hear, by the rural community thereabouts.

In addition to the train running and railway arrangements, the lineside build-up

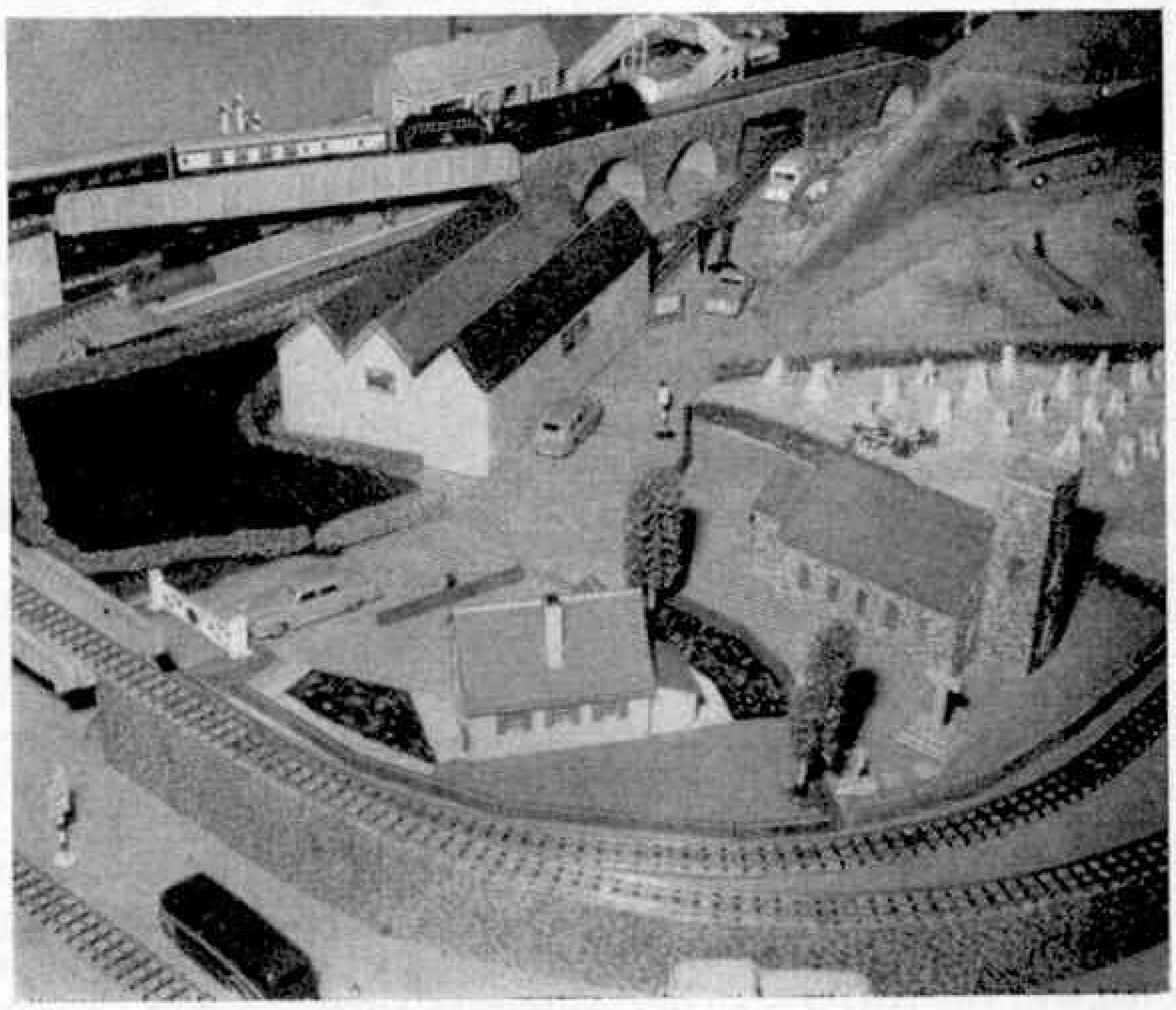


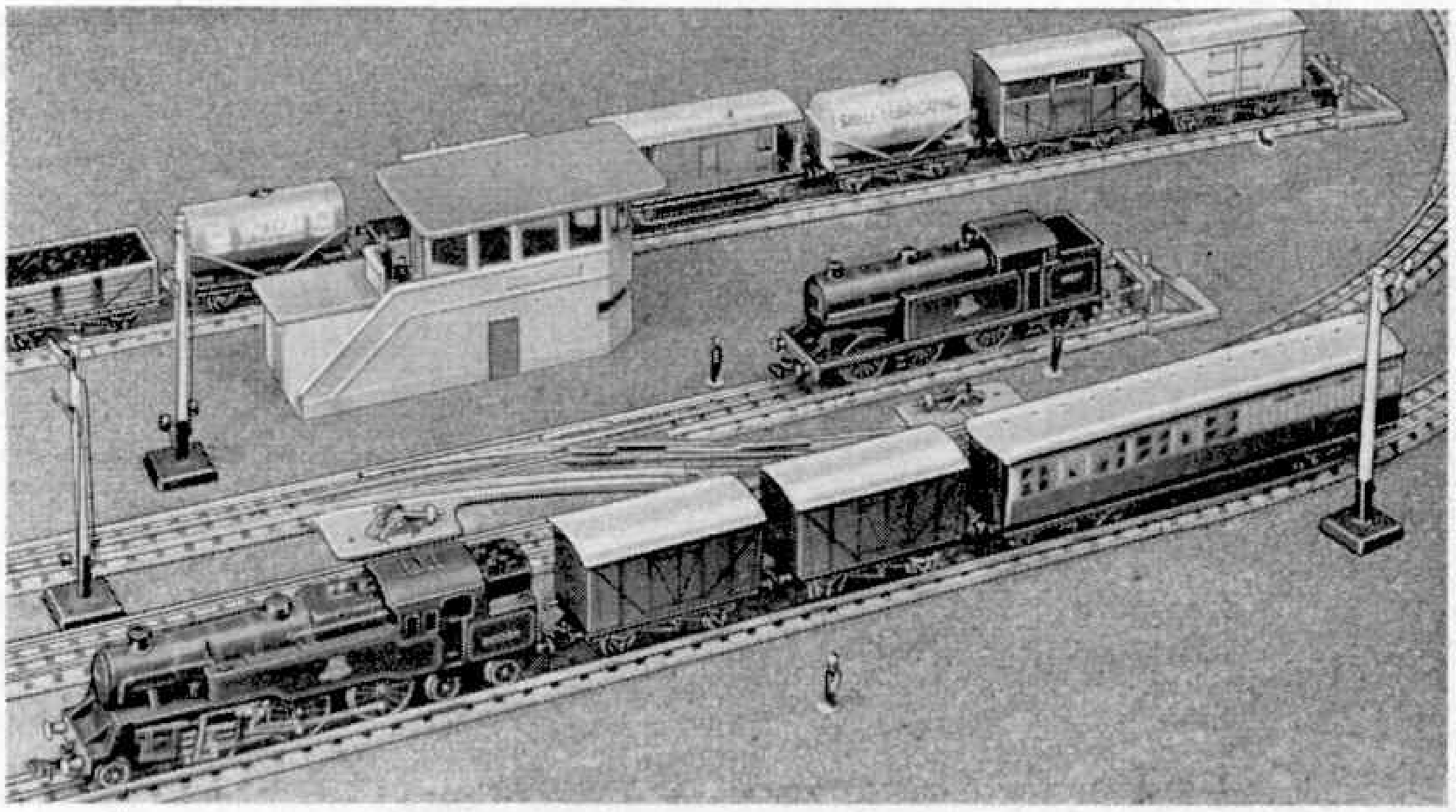
Here are two further views on the layout. Above, is the tunnel and high ground, and part of the town area; below, the engine shed, and cornfield are featured.

is effective, and the situation of the various features has well been considered and certainly well carried out. In this direction particularly, a cousin of the joint owners and engineers has lent a welcome helping hand. Commercial kits have been used for some buildings, while others were built up from scratch, as it were. There is a section of high ground through which two tunnels are driven, and this was made by pinning ordinary stiff brown paper on to a wooden framework. The paper was then covered with size to stiffen it, and painted with green paint. Dashes of brown were introduced here and there. While the paint was still wet, sand was sprinkled on and rubbed in to give the effect of rough ground.

There is of course a road system operated with the railway, and on this and elsewhere various incidents have been arranged. There is for instance a figure representing a climber who is supposed to have fallen from a rocky scree that skirts the line at one point. A group of figures representing the rescue party and a Dinky Toys Ambulance are standing by. There are other episodes too, some connected with the placing of Dinky Toys vehicles, such as the car which has been stopped by the police. Then there are the two figures leaving one side of a house in a hurry as a Tax Official approaches on the other side!

Farm property covers part of the high ground, while below fields occupy the space between the roadway and Greystone Church. When I visited the railway it was harvest time and the surface of one field had been painted a creamy yellow and lightly sanded to provide the correct base for the miniature wheat sheaves that were dotted about the field. These have been made by making bundles of short lengths of sisal cord, with the ends teased out in characteristic manner. Over the road, by the engine shed, there is a furrowed field represented by corrugated card laid down and painted brown. On the whole, the natural effects have been successful.





Using Your Signals Correctly

WE must have signals on our Hornby-Dublo Railways, and we must use them in the right way. The signalling system used in real practice may seem somewhat complex, especially if we judge it by some of the arrangements at large junctions and other busy points. At small stations it is much simpler, however, and with these as examples it is easy enough to arrange the signals on a small layout.

Here a word of warning may not be amiss. Once the enthusiast has grasped the elementary principles of signalling he is often seized with the desire to provide signals to cover *every* possible train movement on his track. A miniature layout usually is fairly concentrated, so if this were fully carried out, the railway would be literally overrun with signals. So don't overdo things. Miniature signals, with their smartly painted posts, show up very prominently on a layout and it is better not to have *too* many.

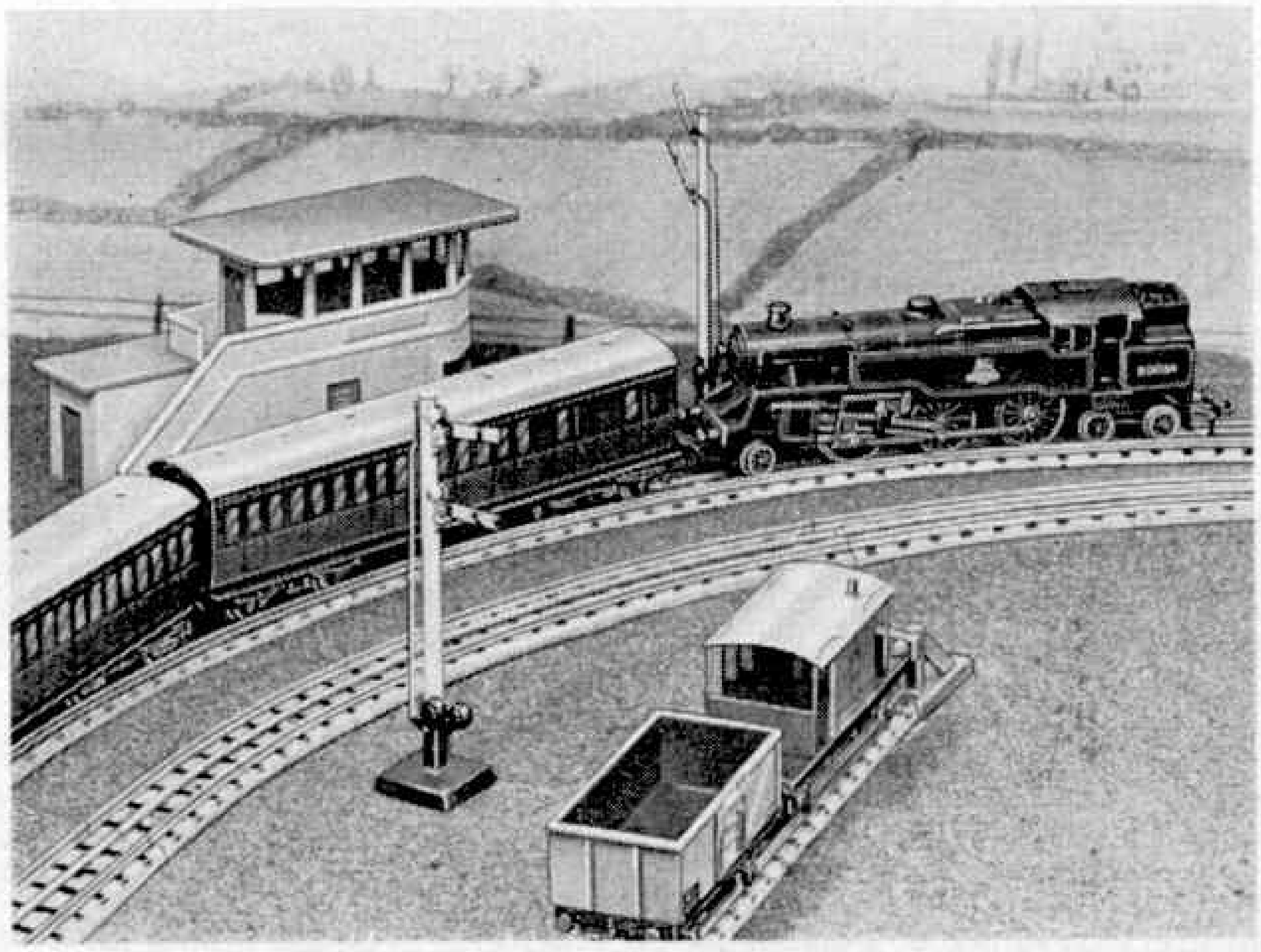
The standard Hornby-Dublo Single Arm Signal with the "home" or square ended semaphore is the one that is needed at the platform end to start the train on its way. It is also used to admit a train to the station, and to protect Points where these are approached by a train in the trailing direction, that is to say one running on either of the two tracks that converge there.

Above, the Hornby-Dublo 2-6-4 Tank has a clear road past the "home" Signal seen on the right of the illustration. On the other main line track the crossover from the loop line is protected by Double-Arm Signals.

As a signal with the home type of semaphore must not be passed by a train when it is in the "*Stop*" position, it is necessary to give the driver of a train some advance information about the home signal, so that he can bring his train to a stand there if it shows "*Stop*." This is done by placing what is known as a "distant" signal at a suitable distance before it. This has a yellow semaphore, with a characteristic "fishtail" end, and is therefore quite distinctive from the home signal, which has a red-painted square-ended arm. On real railways there is another difference. The distant signal displays an orange light when it is in the "*Caution*" position, whereas the corresponding indication of the home signal at "*Stop*" is a red light. Both show a green light when the indication is "*Line Clear*."

In miniature it is not always easy to include a distant signal in its correct position in relation to the next home signal. This can be done if the layout includes a reasonable stretch of main line without any special features, such as stations or junctions and so on, to require a home signal.

Where the distance between signalling sections is restricted in real practice, good use is made of the type of signal that has a home semaphore and a distant



Two Double-Arm Signals appear in this picture, the far one indicating a clear road past the next "home" Signal.

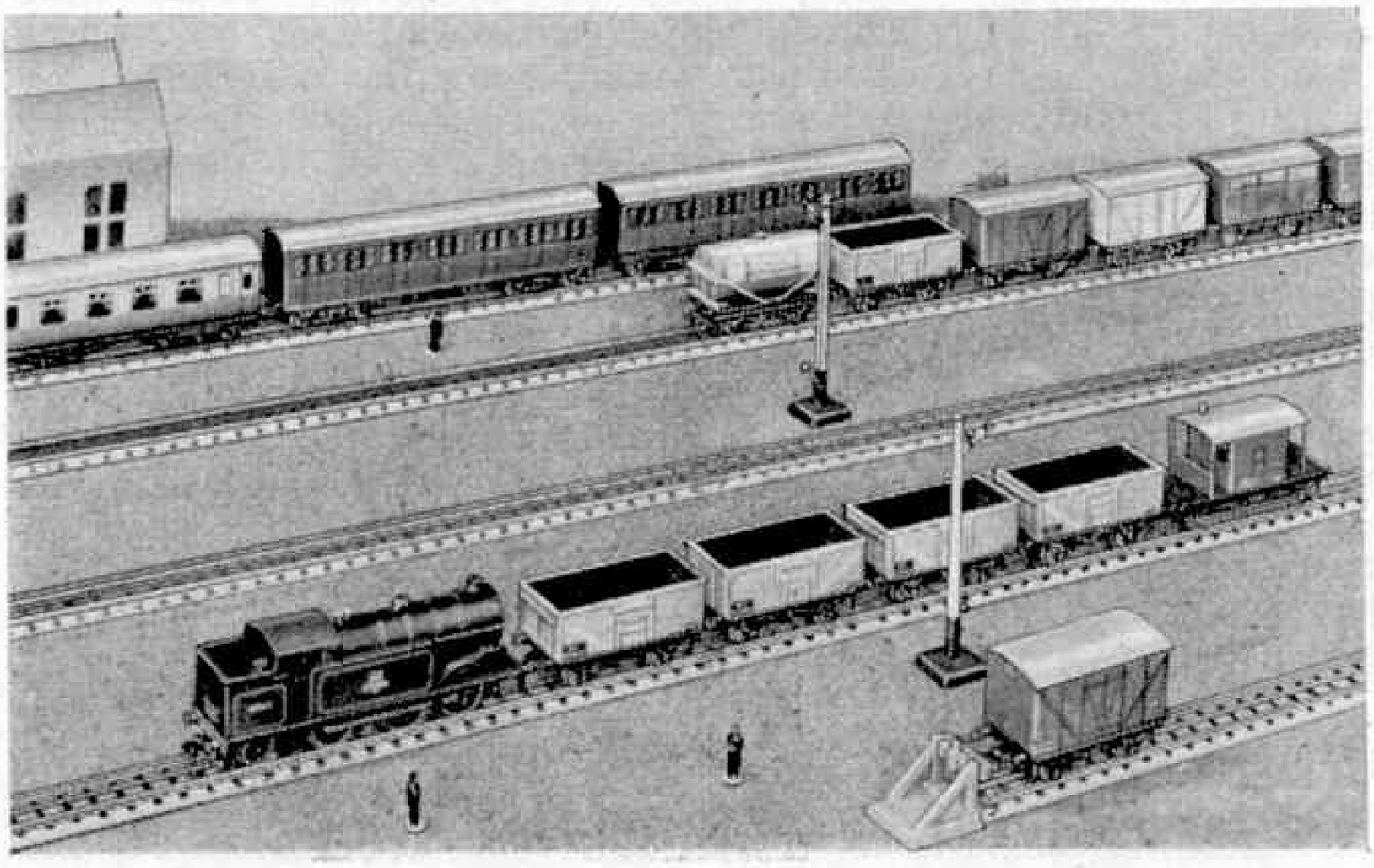
semaphore on the same post. In such cases the distant semaphore applies to the next home signal in advance. It may remain at *"Caution"* while the home semaphore on the same post is showing *"Line Clear,"* but it can be pulled off independently of the latter to show *"Line Clear"* as well, if necessary.

When the home arm is restored to the *"Stop"* position, however, the distant moves with it; otherwise a conflicting indication would be given. Naturally the Hornby-Dublo System includes a Double Arm Signal. This is very useful indeed, as the signalling sections on the average layout are often restricted in length. Several of these Signals are shown in the accompanying pictures.

Where points afford a choice of routes to a train approaching them, so that the train can either carry straight along the main line, or diverge to another track, a signal showing which way the track is clear is necessary. So in the Hornby-Dublo System there is also a Junction Signal. This is made in two types, one with "home" arms and the corresponding one with arms of the "distant" type. Both can be used effectively on main lines where trains are running fast, and the distant type is specially useful where it is necessary for the driver to be warned well in advance of the situation at the Points ahead.

Each of the types of Hornby-Dublo Signals is made for hand working, and there are corresponding Electrically-Operated Signals as well. Those who have Electrically-Operated Points and Signals on their layouts can introduce some useful inter-connection of the two. A particularly handy instance was referred to in these pages in October last, a set of Points being wired to a Junction Signal so that whichever way the Points were set, the corresponding semaphore of the Junction Signal would indicate *"Line Clear."*

Another useful scheme is to place side by side the Isolating Switch and the D1 Switch working the Signal relating to the same section. Then the operator can pull or push the two levers together, so that as the section is cut out electrically the arm of the Signal goes to the *"Stop"* position.



A train of empty mineral wagons on a Hornby-Dublo layout gets a "line clear" indication from the "distant" Signal.

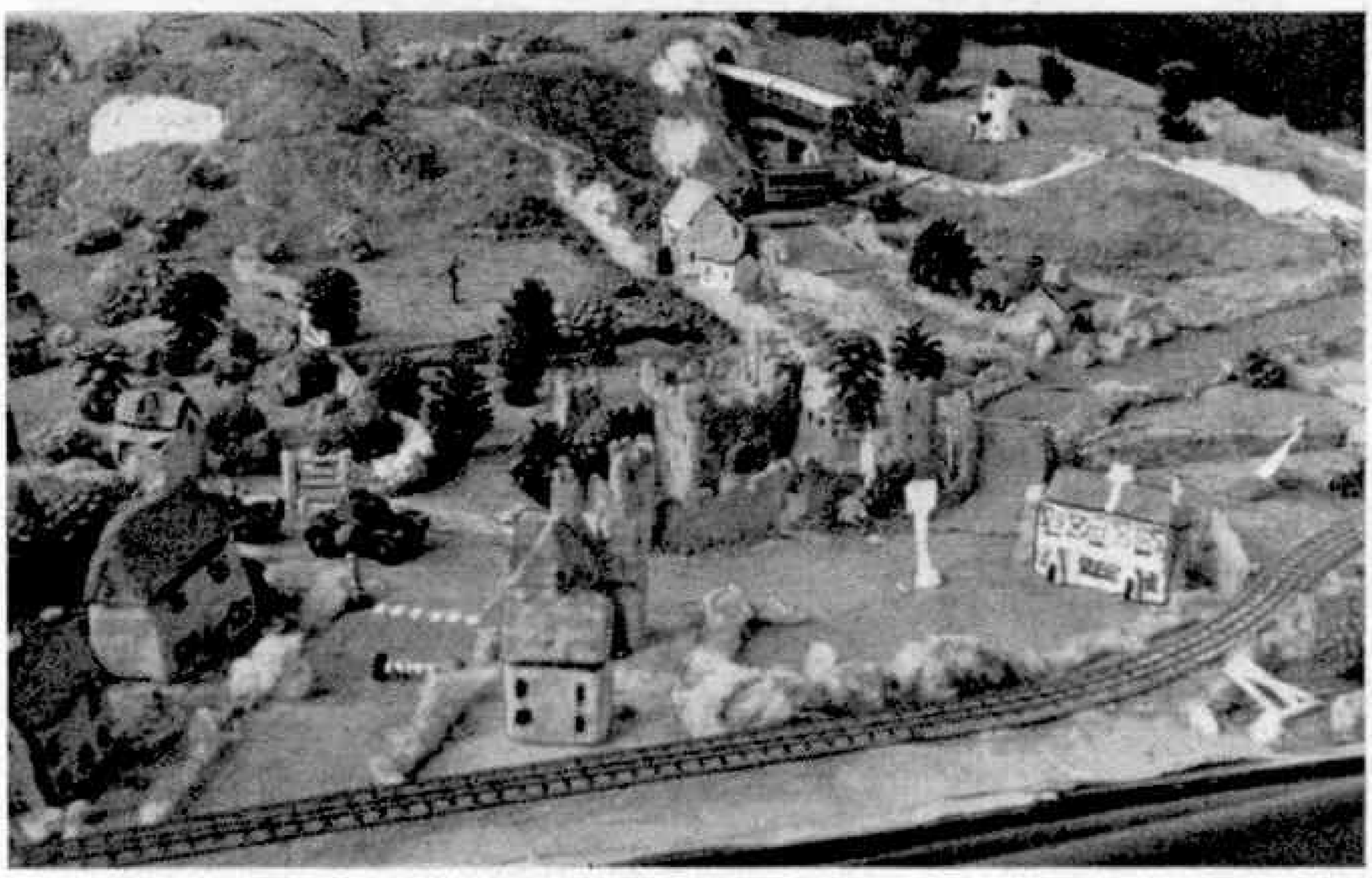
Town and Country

NOVELTY in the setting of any miniature railway system is always attractive. The surroundings of a Hornby-Dublo Railway can be made particularly good, owing to the fairly large amount of layout that can be worked into a given space, and with fine lineside detail the effect is to give a railway with a real look.

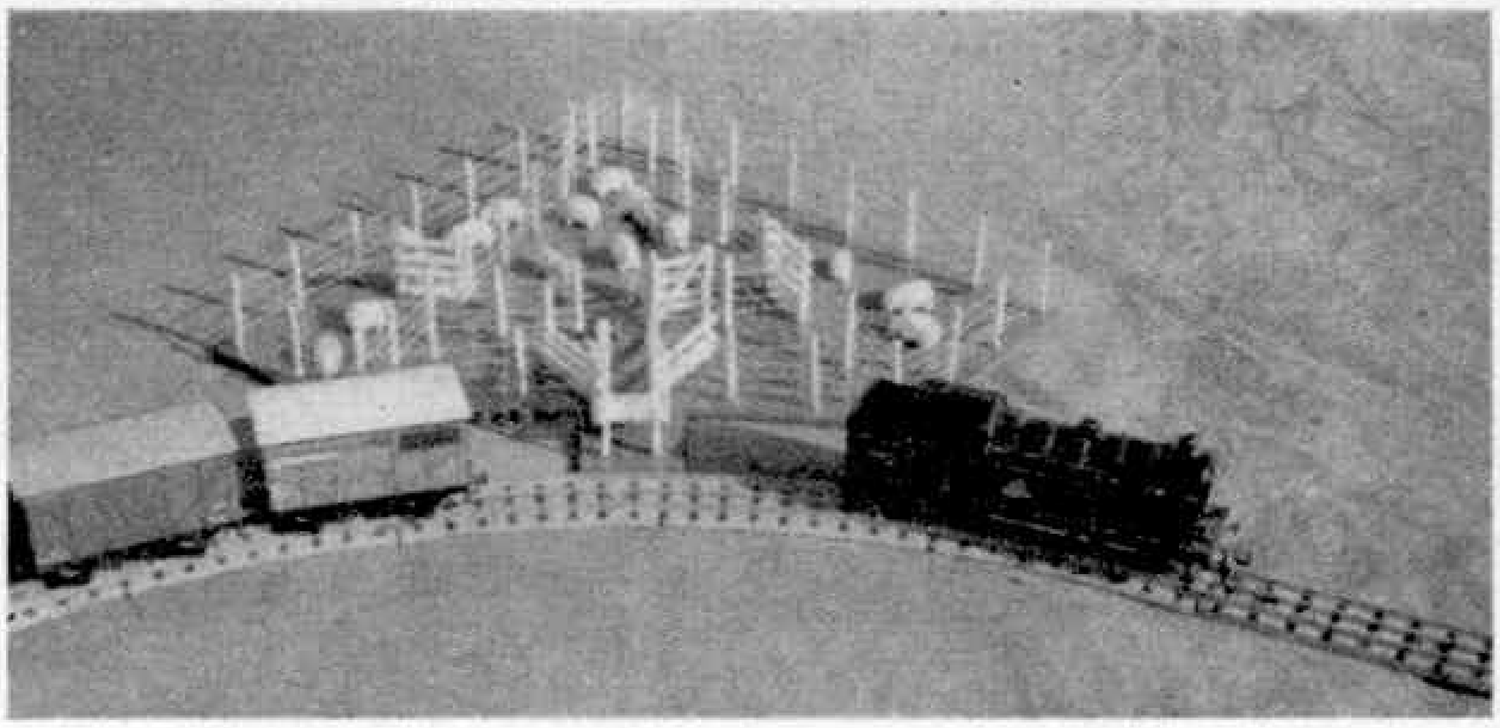
As an example of this, the boys of one of the classes of the Junior Mixed Department of Aylesham County Primary School have managed to give a special charm to a model illustrating natural scenery, in which the Hornby-Dublo equipment belonging to one of the pupils has been incorporated. Mr. E. A. Willcocks, their Headmaster, is naturally proud of their efforts, and in addition to the photograph from which the illustration above was prepared, he has furnished a considerable amount of detail relating to the complete model, which occupies a space measuring 8 ft. by 8 ft.

An area of this size gives plenty of scope for the modeller, and there is a pleasing irregularity about the Disney-like countryside of this layout. The whole scheme was carefully planned to incorporate moorland, river and other scenery, as well as the more ordinary countryside, with a farmstead, an orchard and plenty of fields. The construction of the model was a really combined effort on the part of all in the class, and it is easy to see that everybody concerned has been brimful of ideas.

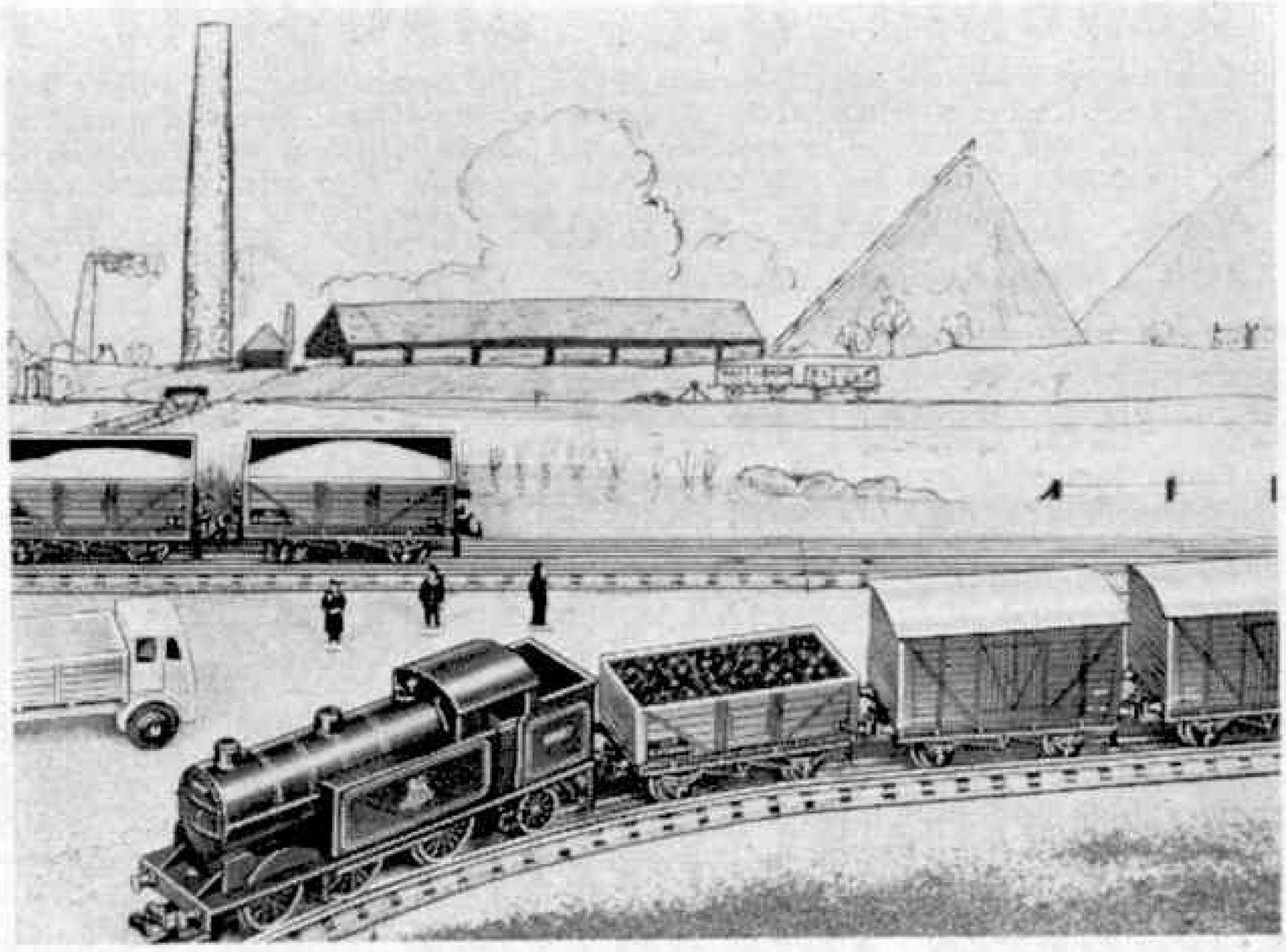
Through the countryside a Hornby-Dublo Railway wends its way to a two-road station, made up of the standard D1 Through Station and the Island Platform, which serves the miniature village, with its varied houses, a church and a battlemented castle. A viaduct, tunnel and level crossing are included in the railway features, one of the tunnel mouths being just visible about the centre of the top illustration. Card, matchboxes, cotton reels, milk straws, clay, plaster and sand, as well as sawdust, were among the materials used to obtain the effects; and how the children concerned must have enjoyed themselves!



A view across country on the nature study layout arranged by pupils at Aylesham County Primary School. The illustration is reproduced by permission of the Headmaster, Mr. E. A. Willcocks.



A neat little sheep pen fills a corner of the New Zealand layout of Mr. L. T. Carrian.



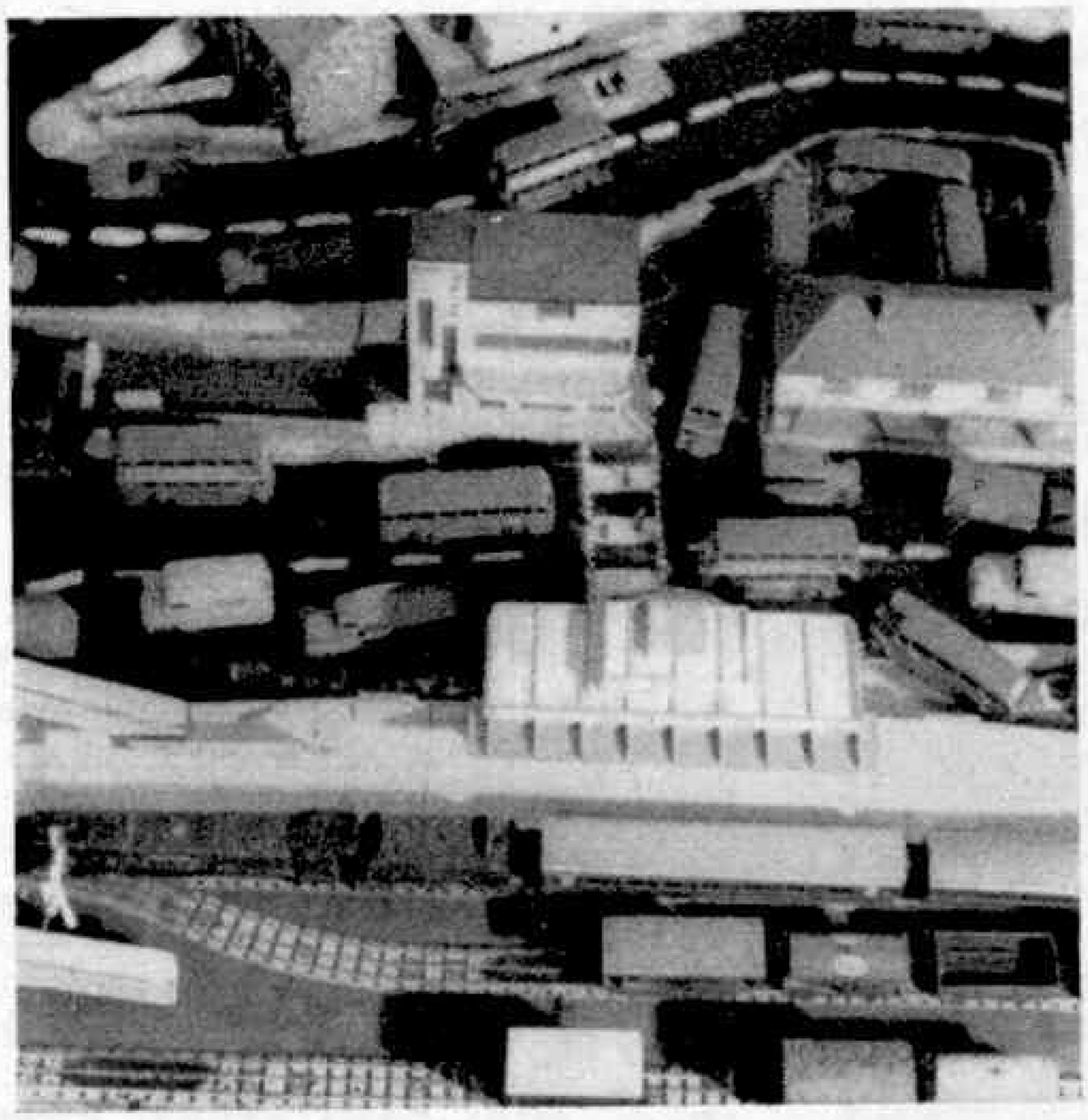
Spoil heaps and a chimney dominate the scenic background strip alongside this Hornby-Dublo layout.

We cannot all, perhaps, hope to build up a model of the extent and variety of this fine effort. But something simpler and quite effective in its own way can be arranged by most of us. A temporary system presents certain problems, but if various lineside features are made to be self-contained then some at least of the difficulties disappear. We have referred before in these pages to the Hornby-Dublo system of Mr. L. J. Carrian, of Palmerston North, New Zealand, which incorporates several items of this kind. One of his "pieces," seen on the previous page, is a characteristic sheep pen, which he uses with great effect to fill one of those awkward outside corners that are found on every layout. The pen, like the oil tank installation that we illustrated in a previous issue, forms a complete unit on its own base and so it can be moved to a new place when the layout is re-arranged.

It is not difficult to follow this plan with miniature buildings, and it does make the work of preparing or clearing up the railway much easier. Again, if alterations are made on the system, and this is a frequent occurrence with non-permanent lines, the various lineside units made in this way can easily be shifted about. Similarly, their handling and storing is made easier for the Hornby-Dublo owner.

Passing from the country in miniature to the town, a pleasing disposition of streets and buildings marks the layout of Philip Slotkin, which was described in the *M.M.* last month. Although the layout is more or less regular in shape, as it has to conform to the shape of the board, the buildings are so disposed that there is a realistic variation in the directions of the roads. This makes all the difference to the look of the layout; a strictly geometrical plan is apt to look rather formal and dull.

Traffic is plentiful on this road system, both double deck buses and single deck coaches—all Dinky Toys, of course—being well represented in the illustration. One feature that catches the eye is the inclusion of a zebra crossing for pedestrians, leading to the Station entrance from the opposite side of the road. You can see this in the centre of the picture, with one or two figures making their way across it.



A town view from the air, in miniature. On this layout of Philip Slotkin, we see the railway station, bus station and the curving High Street.

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For other Stamp Advertisements see also pages 112 and xviii

Stamp Collectors' Corner

By F. E. Metcalfe

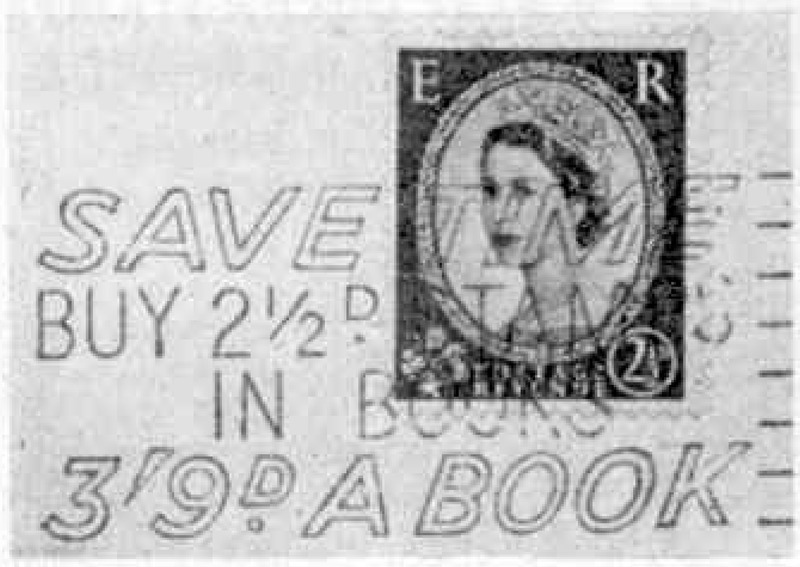
STAMP WASHING DAY

THIS is the time of the year when quite a few new collections are started. An album as a present, or bad weather outside keeping one indoors and a bit bored, are only two of the many reasons that are responsible for the stamp collecting initiative. The point is that many will be thinking of taking up stamps, so a word or two of advice on one or two of the fundamentals of the hobby may not be out of place.

I was talking to a dealer the other day about the display of stamps in his shop window. There were a few sets on stands, but along the bottom were cardboard lids full—more or less—of stamps on piece, that is with the stamps attached to pieces of envelopes, just as they are torn off. You see stamps being offered quite a lot nowadays in this form, and according to the dealer. collectors are taking more and more to stamps left for them to wash off the paper to which they are stuck.

In connection with this washing off process, I read in a magazine what purported to be advice on the subject, and it was just nonsense. Collectors were advised to float their stamps and not "drown" them. Follow that advice, and most of your stamps will look simply awful, for in many instances much of the gum will remain, giving the stamp that almost translucent appearance, which spoils the look of any stamp.

Now it is a fact that while the ink will run when stamps are placed in water, in a very few cases, generally speaking, the ink used for stamps is fast enough to allow the small risk to be taken to ensure a good washing job. Where there is a real danger is in the paper on which the stamps are stuck, for if this is coloured, particularly in the case of blue, the dye may tinge the stamp. I suppose that I have washed off hundreds of thousands of stamps, and the system I have evolved is the result of much experience. So let me go through the drill I follow when I get a batch of stamps and wish to deal with them.



First of all, it should be explained that there is a growing interest in postmarks. and many collectors

collect them for their own sake alone. Consequently I carefully exclude from the washing operation all pieces that have an attractive, or even a clear postmark. Collectors of used stamps prefer a round postmark, but if there is a slogan attached then the piece of envelope showing the latter, as well as the date, etc., in the circle, makes a nice piece to mount.

I don't know if collectors at home have ever seen a modern German collection—the hobby is very popular in Germany and on the rest of the continent for that matter—but there most used stamps are mounted with the stamp on piece, which is neatly trimmed, to show off the whole of the postmark, and the custom is growing in popularity here at home.

Having taken out the stamps with the neat postmarks or slogans, then I remove all stamps that are on pieces of coloured envelopes, for here is a very real danger to avoid. The colouring in some of the envelopes runs very easily, as I have already stated, but repeat to drive home the point, and if soaked for any length of time in water will not only stain the stamps attached, but any others that may come in contact. These coloured pieces must be treated separately and with speed. So what I do is to place them individually in lukewarm water and remove the stamp the moment it can be loosened from the piece of envelope, which is generally quite soon after the piece has been immersed. So don't prepare the washing and leave it for a spell, or else you may spoil the stamp. Once the piece of paper has been removed, you can put the stamp back into water until all the gum has been removed.

I have mentioned that the ink on a few stamps does run. If your stamps are recess printed, lithographed or typographed, you are generally safe enough. But one or two of the Malayan stamps, such as the 5c. for the various states, need watching. There are a few stamps printed by the photogravure process that also need watching, but on the whole it pays best to give stamps a good soaking to remove all the gum as well as the paper to which they are attached.

I mentioned postmarks. I only wish there were more room to illustrate many that I have picked out of a single small office lot. The stamps themselves have little value, and even with the postmarks their monetary status has not improved, but they look awfully nice in a collection.

Just examine that one of Rhodesia and Nyasaland. Can you guess who the man is? Incidentally, I have had to leave out the date circle; otherwise there would not have been room *(Cont. on page 114)*

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For other Stamp Advertisements see also pages 110 and xviii

Stamp Gossip

PRIME MINISTERS

AS I have remarked previously, no stamps are more popular with British collectors than those of Canada, our sister nation. Her new stamps are not only of interest, but are snapped up quickly. The latest to be released are a couple of the Prime Ministers series, the third lot to be issued. The 5c. shows a portrait of Sir C. Tupper, and the 4c. that of Right Hon. R. B. Bennett. I am asking the Editor to illustrate a copy of the latter.

In time these sets will make a nice show — I understand that it is intended to honour all past Prime Ministers in this way—so young collectors should get those already issued, in fine used copies. They will only cost a copper or so each. For the sake of those who have not got a catalogue, here is a check-list. **1951** 3c., Sir R. L. Borden; 4c., Mr. Mackenzie King. **1952** 3c., Sir John Abbott; 4c., Hon. Alex. Mackenzie. **1954** 4c., Sir J. S. D. Thompson; 5c., Sir M. Bowell. **1955,** 8th November, as given above.

KING GEORGE VI STAMPS

Mentioning catalogues, the latest Commonwealth Catalogue was published 7th January and is devoted to KGVI stamps, which still remain the most popular group of issues in the whole philatelic world. It was thought when the late sovereign died that interest in his stamps would die also. Not a bit of it, in fact in the U.S.A. and Canada, as a case in point, they are more popular than ever.

The catalogue is a bound book and costs 6/–, a price only possible for such a volume because there are so many collectors that a big printing can be made, which of course reduces the cost of each one. From the letters I get from Meccano readers, I would say that a very big percentage of them are particularly interested in the stamps of the last reign of our Commonwealth and the present one and with a long experience on which to base my judgment I would say that they could hardly do better than collect George VI.

UNUSED OR USED STAMPS

Don't blame me, please, for bringing up this subject again. A young collector from Bradford has written a nice letter claiming that mint stamps are much better than used, but this is not always the case by any means. Taking the stamps of the Commonwealth to which my correspondent refers, in the case of the larger countries like Australia, Canada, New Zealand, etc., unused are generally the best, but used are very often scarcer when it comes to the smaller colonies. In consequence they are worth more. But you cannot lay down a hard and fast rule.

A FALLEN LEADER

Some time ago, a reader complained that I never mention that interesting country of Paraguay. I *have* mentioned it more than once, and now as it has issued an interesting set of stamps, I am referring to it again.

Once upon a time Paraguay, though much smaller in population, held the Argentina at bay, but latterly it has seemed more or less in Argentina's pocket, and Peron, now deposed, dictated to it almost as much as he did to his own nationals. The stamp illustrated shows his portrait along with that of the head of Paraguay, and maybe one day we'll hear of the fallen leader running the latter country. Stranger things have happened in South America in the past.

EMBOSSED STAMPS

A reader, noticing the embossed stamp illustrated in the October *M.M.*, asks if there are any special precautions to be taken in mounting such stamps. This gives me a good opportunity for again mentioning how important it is not to keep your stamp albums flat. To do so is really bad for ordinary stamps; it is almost fatal in the long run as far as embossed stamps are concerned, for the embossing will gradually disappear. Albums end up, please, if you care at all for your stamps.

PYTHAGORAS

I am not too sure that the Greek stamp illustrated will be particularly popular with some young readers, but no-one will deny its novelty. It is part of a set of four issued on 20th August to commemorate the Pythagorean Congress. The 3.50 value shows a representation of the Pythagorean theorem. Being on delicate ground, with schoolboys at any rate, perhaps I had better get on to my next topic.

FINLAND

This no doubt will be much better received than a geometrical proposition, for no stamps are more popular than those depicting ships, and when a stamp of Finland also is concerned, then all is well. This stamp was issued on 2nd September and commemorates the 350th anniversary of Oulu, one of Finland's ports.

Oulu is on the Gulf of Bothnia, the northward extension of the Baltic Sea. It was founded in 1605 on the site of an older settlement, and besides being a port has many manufactures.

Smoke-Jumping—(*Continued from page 66*)

Service's 231 parachutists made 1,153 jumps to 328 fires. The cost was £100,000, but the estimated saving in fire-fighting expenses was nearly £200,000, not counting the value of the timber that was saved.

Ground fire-fighters are still used in areas where good roads exist. Elsewhere, the use of smoke-jumpers can save up to 10 hours of hard travel. This is of vital importance, because one or two men reaching a fire soon after it starts are more effective than an army of men a day or so later, when a smoulder may have grown into a roaring, forest-devouring monster that destroys everything in its path.

Because of this, the number of trained smoke-jumpers is growing every year, and so is the value of timber which they save. In the last year for which figures are available, there were 269 of them, and they made 1,754 jumps to 489 fires. In addition, a total of 23,371 fire-fighters and other passengers were carried by aircraft owned or hired by the Forest Service, including quite a lot by helicopter, and more than a million pounds of supplies and equipment were parachuted to fire-fighters.

As well as locating and fighting fires, aircraft are used today for aerial survey of forests, re-seeding burned areas, spraying insect pests, search and rescue, to trap people who start fires, and even for dropping thousands of tiny fish from the air to re-stock lakes in mountain regions. But that is, of course, another story.

Runs on Anglo-Scottish Expresses—

(*Continued from page 69*)

The hard work was over; *Seagull* was eased and was still in splendid form, with plenty of steam and coal left on the tender as an indication of efficient and economical performance. Operating efficiency, too, had ensured that the hundreds of signals for which the driver must watch closely had all been at clear in the country, as well as at big stations and numerous junctions for 387 miles, and the all-important water supply for the boiler had been replenished five or six times from track troughs.

In the London suburbs adverse signals did slow us, twice, but we kept moving and glided to a stop in No. 2 platform, King's Cross, at 4.14, a minute early. We had run almost 393 miles in 389 min. overall, or about 384 min. net on allowing for extra speed restrictions. The world-record run had been achieved once more on its fastest-ever timing and with a little in hand. Congratulations to all concerned!

Meccano to the Rescue!—(*Continued from page 99*)

was soon made and proved so effective that they are still in use. A picture of these compasses and other useful drawing instruments made by the young Watsons appears on page 99.

These two examples of the domestic uses of Meccano proved the turning point. Household crises are now met quite calmly, sure in the knowledge that whatever the gremlins prepare, Meccano is a beneficent fairy godmother who with a few waves of a Screwdriver can wreck their most diabolical plans!

Tyewriter Story—(*Continued from page 95*)

in a line of otherwise correctly aligned type. Skilled inspectors carry out test after test to ensure that no machine leaves the works until type alignment is perfect.

Before the tabs showing the various characters are fitted to the ends of the key-levers, the type-unit has all its working parts thoroughly lubricated. It is then subjected to a test lasting at least an hour carried out by the robot typist seen in the picture on page 93. This is an automatic exercising machine that strikes the key-levers at the rate of 900 per minute, which is equivalent to 180 words a minute.

Final assembly proceeds with all the precision and teamwork associated with the D-Day landings. It's action stations for people and parts, with group leaders, adjusters and inspectors all along the line. The finished machine then undergoes a rigorous operator's test at the hands of a typist and any minor faults revealed are promptly adjusted. A final check is made, a specimen of the work done by the particular machine is filed for reference and then the new-born typewriter goes on its way rejoicing to the Finished Products Store.

New Meccano Model—(*Continued from page 101*)

2 of No. 13; 3 of No. 13a; 6 of No. 15; 6 of No. 15a; 6 of No. 15b; 2 of No. 16a; 6 of No. 16b; 1 of No. 17; 6 of No. 20; 2 of No. 24b; 6 of No. 25; 2 of No. 26; 2 of No. 27a; 1 of No. 27b; 1 of No. 28; 1 of No. 32; 437 of No. 37a; 434 of No. 37b; 96 of No. 38; 6 of No. 48a; 4 of No. 52a; 2 of No. 53; 3 of No. 55; 34 of No. 59; 4 of No. 63; 6 of No. 63d; 9 of No. 89b; 48 of No. 90; 1 of No. 94; 2 of No. 96; 10 of No. 111c; 6 of No. 116; 9 of No. 133a; 1 of No. 146; 1 of No. 162a; 12 of No. 189; 12 of No. 190; 13 of No. 191; 4 of No. 197; 9 of No. 213; 3 of No. 215; 6 of No. 221; 1 E20R Electric Motor.

Stamp Collectors' Corner—(*Continued from page 111*)

to illustrate them all. But when you cut your own out, leave these on the piece of course.

I have said already that collectors like round postmarks, but most envelopes are cancelled by machines nowadays, and all you generally get across the stamps are a few straight lines; the round cancellation is more to the middle of the envelope. Collectors get over this by asking people who write to them to affix their stamps more to the left than is normally the case.

Whether you go in for postmarks or not, do go in for washing your stamps properly, and after taking out the colours give them that good soaking. Incidentally, our own stamps are as safe as houses. So are stamps from Australia, Canada, South Africa and U.S.A., and all the line engraved of the colonies. As for those of Europe of today, I don't know any that will suffer in the slightest for a good ducking, but do watch the paper they are on. See that it is not coloured.

Making Heavy Diesel Engines—(*Continued from page 63*)

on a machine in which the crankshaft is rigidly mounted, and the cutting tool travels round the crank pin. One of these machines is seen on the right of the upper illustration on page 63.

Other parts of a finished diesel engine are made by similar means, each with the greatest precision. The final stage is the assembly of a finished engine, and the flow plan is such that all components are issued direct from stores to the sub-assembly sections and main engine components direct to the main assembly stations.

In addition to the K range, two other series are in current production at Hazel Grove. Those of the TL range have a bore of 8½ in. and a stroke of 13¾ in. in the three to five cylinder units, and a 13 in. stroke in the six cylinder unit. They cover a power range from 157 to 405 b.h.p. at a standard speed of 600 r.p.m. The third range, distinguished as J engines, is produced in both in-line and Vee form, with from three to sixteen cylinders. With a bore of 9¾ in. and stroke of 10½ in., it is suitable for speeds up to 1,000 r.p.m. and covers a power range of 114 to 2,240 b.h.p.

THE MINIATURE SKYLON

The article on the weather station at St. Crispins' Secondary Modern School, Wokingham, promised last month, has been unavoidably held over. It will appear in the March *M.M.*

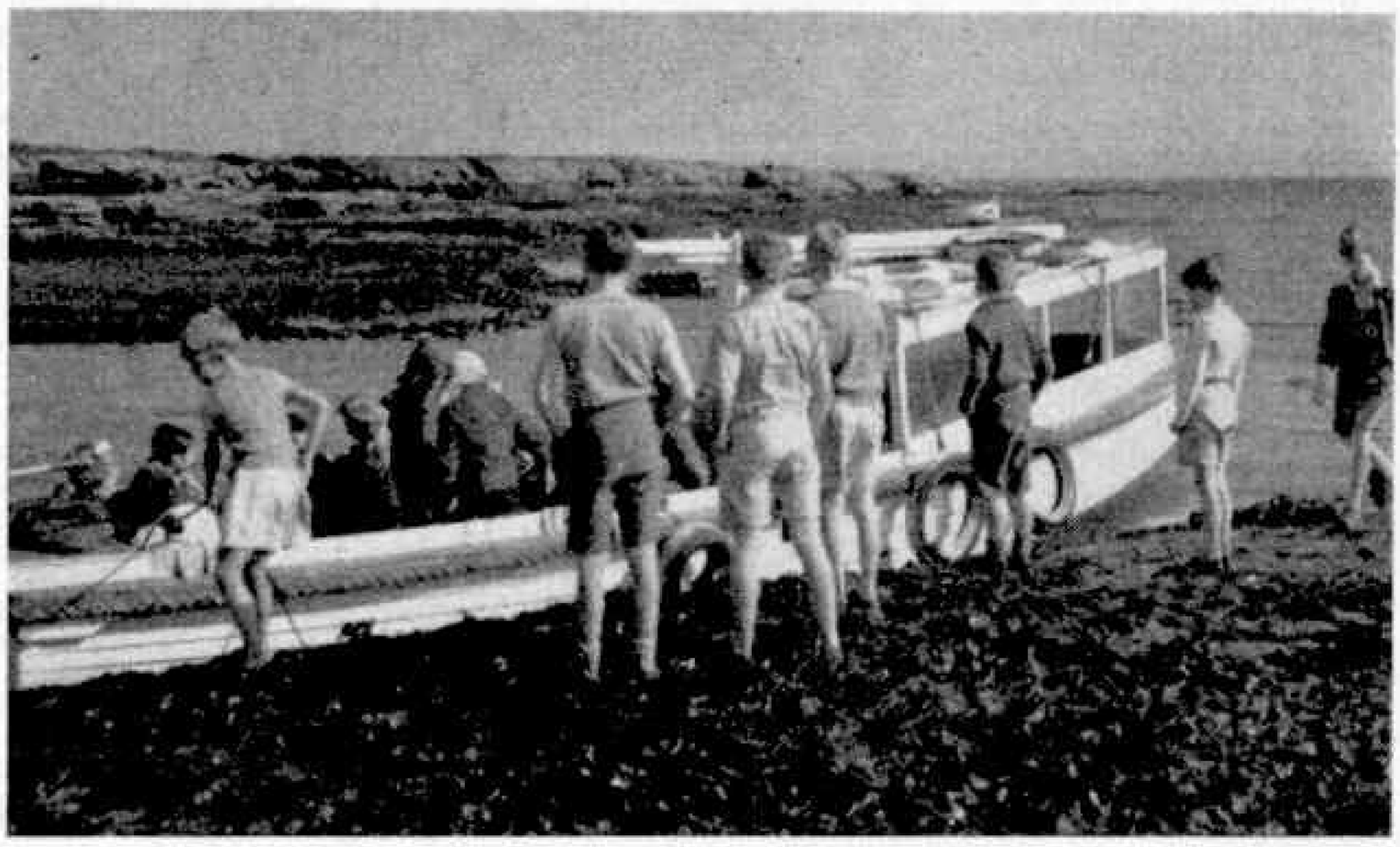
From Our Readers

This page is reserved for articles from our readers. Contributions not exceeding 500 words in length are invited on any subject of which the writer has special knowledge or experience. These should be written neatly on one side of the paper only, and should be accompanied if possible by original photographs for use as illustrations. Articles published will be paid for. Statements in articles submitted are accepted as being sent in good faith, but the Editor takes no responsibility for their accuracy.

THE FARNE ISLANDS

During a stay on the Northumberland coast I saw many castles and quiet bays, but it was the trip to the Farne Islands that I remember most of all.

A sail of some 4 miles brought us to Crumstone, where we were amused and delighted by the antics of hundreds of seals basking on the rocks or playing in the water with just their heads in view. They would bob up, take a look at us, decide we weren't worth wasting time on, and then disappear under the water, doubtless in search of food. Those on the rocks just lay in the sun until the boat got within about 100 yards, when the parents pushed the younger members of the family into the water and then followed. The seals when fully grown average 7 feet in length.



Preparing to leave Seahouses for the Farne Islands. Photograph by F. D. Head, Worcester.

In less than two miles we reached Longstone, where the lighthouse keepers met the boat and handed us their mail to post. The present lighthouse was built in 1826 and is famous in history for the heroic rescue made from there 12 years later by its keeper William Darling and his daughter Grace. At Brownsman we were able to see the cottage occupied by the Darlings before the new lighthouse on Longstone was built, and the old beacon tower beside it.

The Farnes are of course a bird sanctuary and gain their greatest fame in the nesting season. The Pinnacles, which rise over 40 ft. above high water mark, are then covered to the summit, every ledge and nook with the eggs of guillemot, razorbill and kittiwake. Brownsman is also a favourite with sea birds, and there we saw the oyster catcher, cormorant and kittiwake. The ground beneath our feet was riddled with holes where puffins had lived during the nesting season.

F. D. Head (Worcester).

St. Mark's Cathedral, Venice. Photograph by R. F. Lovesey, Brackley.

A DAY IN VENICE

I visited Venice when living in Trieste, making the journey by bus. From Piazza Roma, where the road ended, I made my way to the Grand Canal, where a canal bus took me to St. Mark's Square. On either side of the canal were the typical gaily striped gondola mooring poles. To take the place of the normal city taxis, there were not, as I expected, hundreds of gondolas, but powerful modern launches, and the large number of gondolas I saw provided a luxurious rather than a practical means of transport.

St. Mark's Square is probably the most beautiful part of Venice. It has an oriental air about it, and is very beautiful and interesting. In the Cathedral is an ingenious clock, in which every hour a figure raises his hammer and strikes the time on a bell.

As is quite common in Italy the campanile, or bell-tower of St. Mark's is separate from the main body of the church. It is very much younger than the Cathedral, for the original fell down, without warning, in 1902. The present tower is made of large red blocks. Its style seems to be in contrast to that of the Cathedral, but it is beautiful in its own way.

Another building on the Square is the Doge's Palace, the façade of which has some wonderful designs executed on it in coloured tiles. Behind it is what is probably the best known famous edifice in Venice—the Bridge of Sighs. What did surprise me was the rather insignificant canal which the bridge crossed, and in fact I had expected a bigger bridge altogether.

R. F. Lovesey (Brackley).

Fireside Fun

Judge: "Defendant said you were a rogue. Is that correct?"
Plaintiff: "Yes, sir."
Judge: "Then why are you bringing an action?"

* * * *

Tom: "Do you know how to find the weight of an elephant?"
Harry: "No. How?"
Tom: "Put your toe under its foot."

* * * *

The visitor's nose was long and red, and mother noticed young Johnny staring at it. Fearing the child was about to make some comment, she gave him a disapproving glance.
"All right," said Johnny, "I'm not going to say anything, I'm only looking at it."

* * * *

Pilot: "Good heavens, the engine's stopped and a wing has come off."
Nervous Passenger (on first flight): "Thank heaven for that. Now we will have to land right away."

* * * *

John: "Have you got the time?"
James: "Part of it. The hour hand is missing from my watch, but it's ten minutes to something."

* * * *

"It's good of you, doctor, to have come this far to see my husband."
"Not at all, madam, not at all. I have a patient next door; so I thought I'd just kill two birds with one stone."

* * * *

Teacher: "How is it you cannot answer any of my questions?"
Pupil: "Well, if I could, what would be the use of my coming here?"

* * * *

A patient told his doctor that he always drank 15 to 20 cups of strong coffee a day.
"Doesn't it keep you awake?" the doctor inquired.
To which the patient replied, "It helps."

* * * *

HOWLER!

"The Mediterranean and the Red Sea are connected by the Sewage Canal."

* * * *

Teacher: "What do you call a person who keeps on talking when people are no longer interested."
Pupil: "Please sir, a teacher."

* * * *

Diner: "I've been waiting half-an-hour for this turtle soup."
Waiter: "I'm sorry sir, but you know how slow turtles are."

* * * *

Johnny: "Tell me, papa, what is a consulting physician?"
Father: "A doctor who is called in at the last minute to share the blame."

* * * *

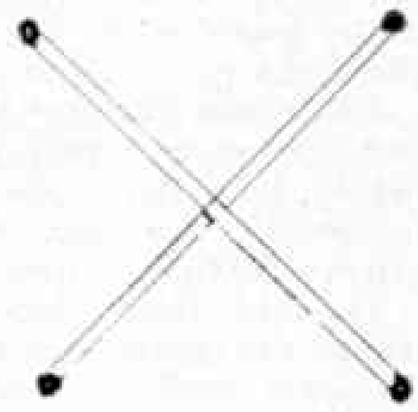
Jones: "What is your occupation?"
Smith: "It isn't an occupation, it's a pursuit I'm a bill collector."

* * * *

BRAIN TEASERS

THE SQUARE MADE WITH MATCHES

Arrange four matches on the table to form a cross as shown in the sketch, and then ask your friends if they can move only one match and form a square.

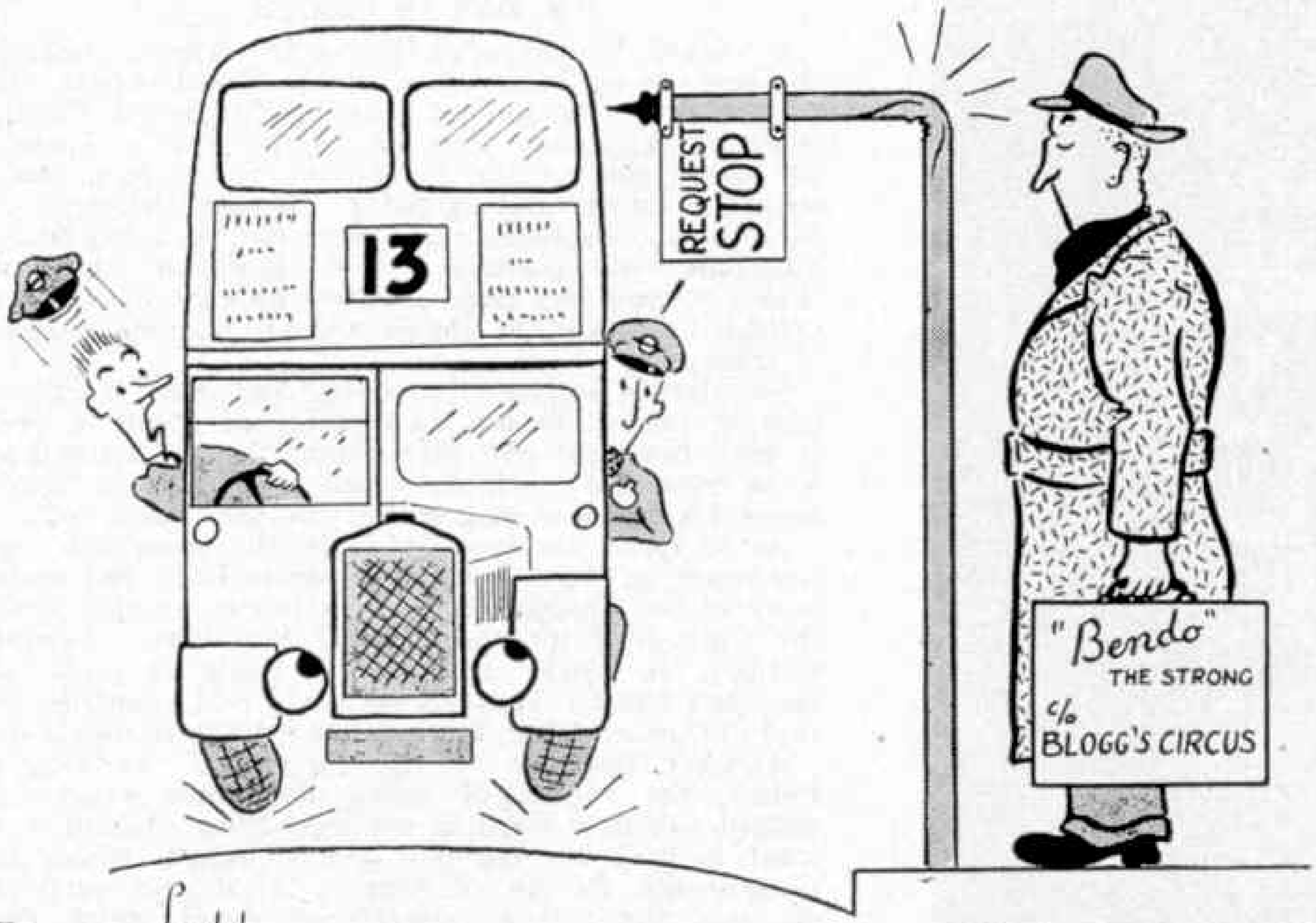


* * * *

THE BIG FISH

Dick (to Tom coming home from fishing): "Did you catch anything Tom?"
Tom: "Yes a big one."
Dick: "How big was it?"
Tom: "It's head was 9 in. long."
Dick: "How long was its tail?"
Tom: "As long as its head, and half as long as its back."
Dick: "How long was its back?"
Tom: "As long as its head and tail put together."
How long *was* Tom's fish?

* * * *



SOLUTIONS TO LAST MONTH'S PUZZLES

What is the Word?

The word is "Underground."

* * * *

Historical Quiz

The building on fire was St. Paul's Cathedral during the Great Fire of London. It is described in *The Tower of London*, a famous historical novel by Henry Ainsworth.

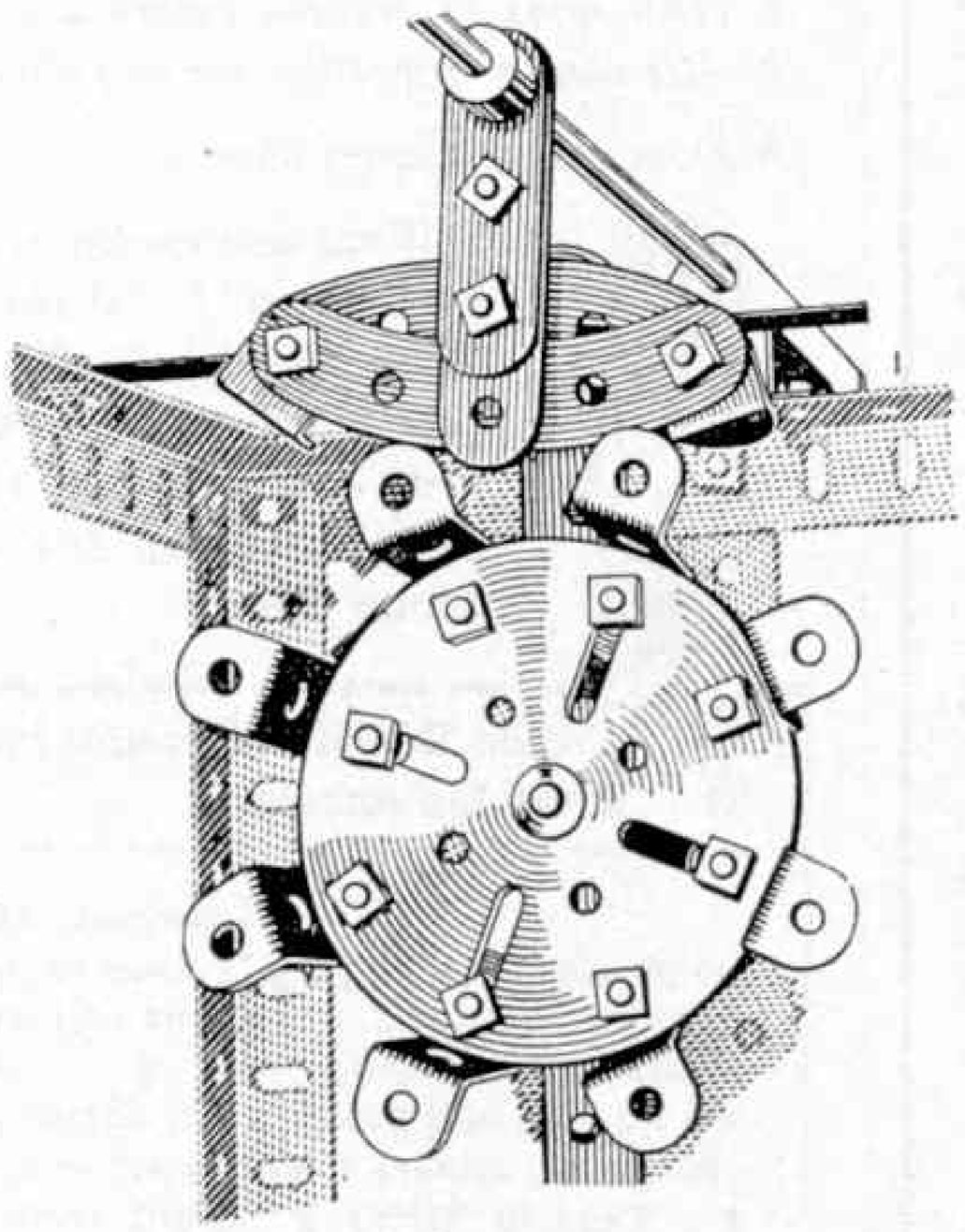
* * * *

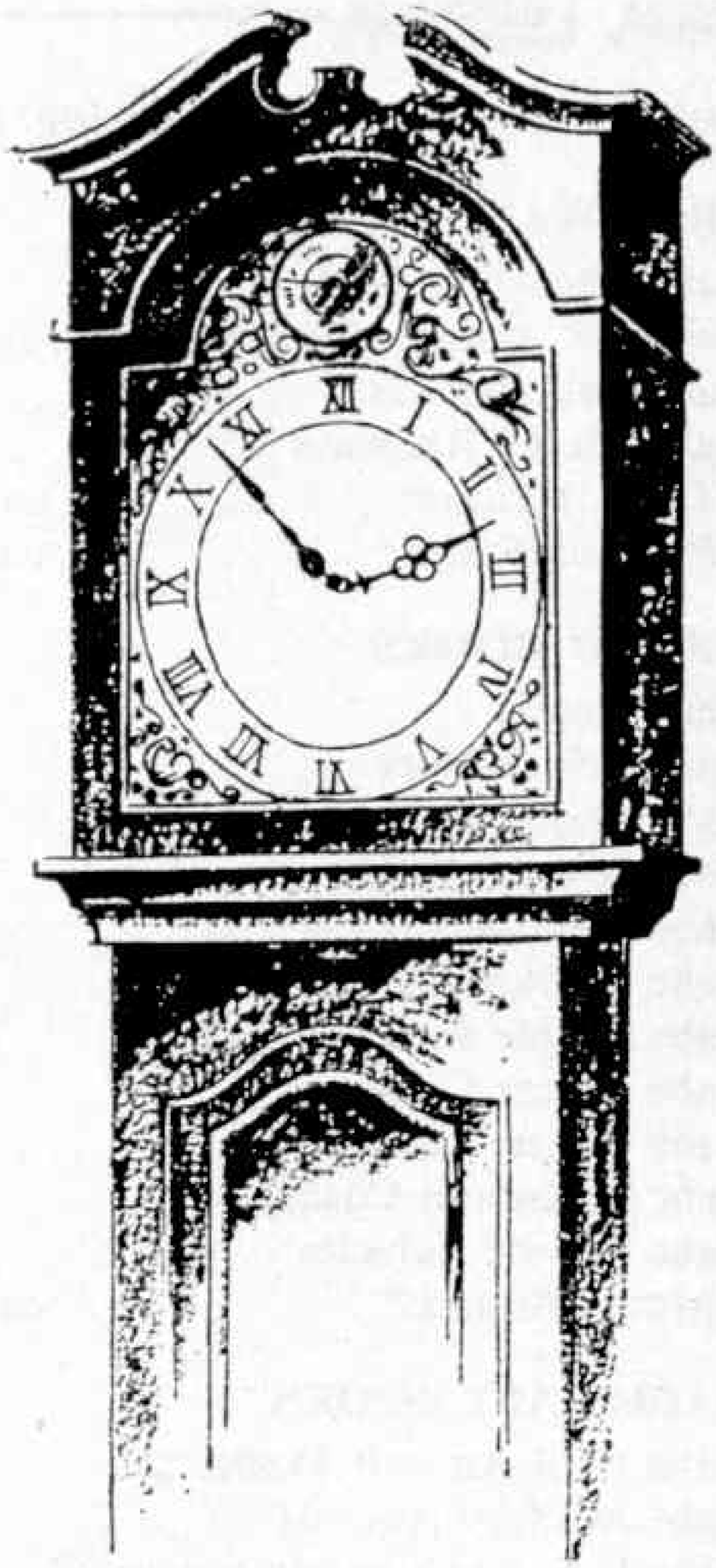
The Missing Letter

The letter that must be added to each syllable is "X".
Lax, Fix, Vex, Cox, Tax, Fox, Box, Mix.

How does a clock keep time?

Grandfather and other similar pendulum clocks are controlled by the 'escapement'—a mechanism which allows the hands to move a constant distance with each swing of the pendulum. Meccano boys know all about it—for this is only one of the countless devices that can be built with Meccano and used in fascinating models that really work, including Meccano clocks that keep perfect time.





Here is a pendulum-operated escapement mechanism built with Meccano.

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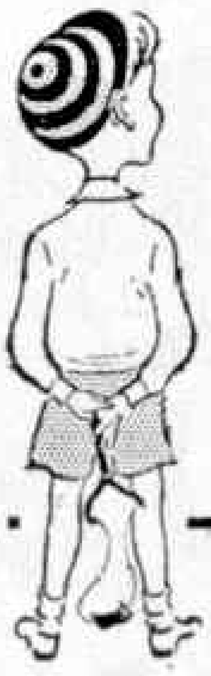
1 *All pneumatic tyres need inner tubes — true or false?*

2 *Who was the first man to ride 20 miles in the hour on a bicycle and in what year did he do it? (a) Cortis in* 1882, *(b) Johnny Dunlop in* 1889, *(c) T. A. Edge in* 1884*?*

3 *Heat must be created before a car or bicycle can be stopped—true or false?*

4 *Does rubber always bounce?*



5 *What was known as "the yard of tin"? (a) the first safety bicycle, (b) the horn carried on stage-coaches to give warning of their approach, (c) the first Motor Show?*

The **DUNLOP** *cadet knows all the answers . . .*

1 False — Dunlop Tubeless tyres need no inner tube. **2** Cortis in 1882. **3** True — the vehicle's kinetic (or stored-up) energy is converted into heat by the brakes. **4** No. Dunlop experiments show that at —84° F. rubber becomes as solid as wood. **5** The horn carried on stage-coaches.

SCORING : 10 marks for every correct answer. 50—top of the class. 30-40—Good. Below 30—Smarten up there !

This quiz is provided for your amusement by the Dunlop Rubber Company Limited SH/105

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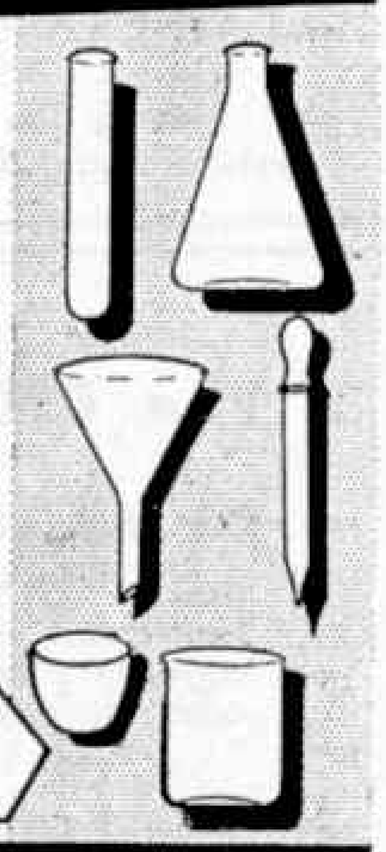

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1½ × 1/8	9d. yd.	1½ × 1/4	1/– yd.
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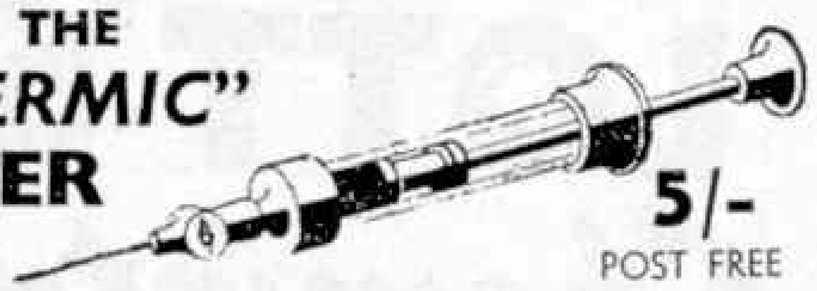

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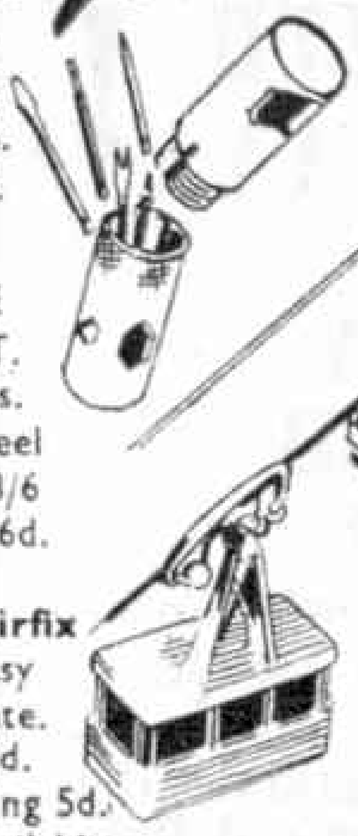

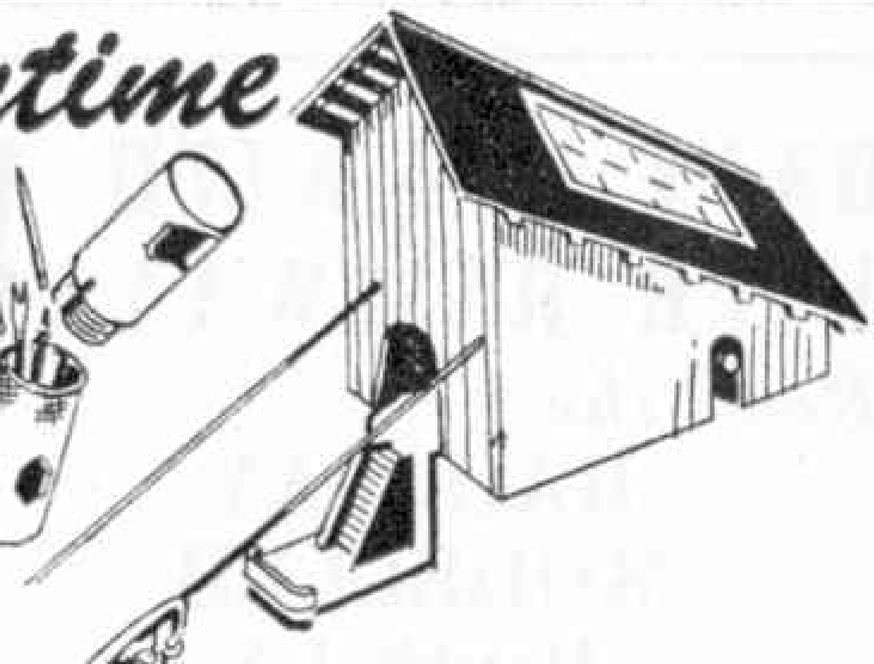

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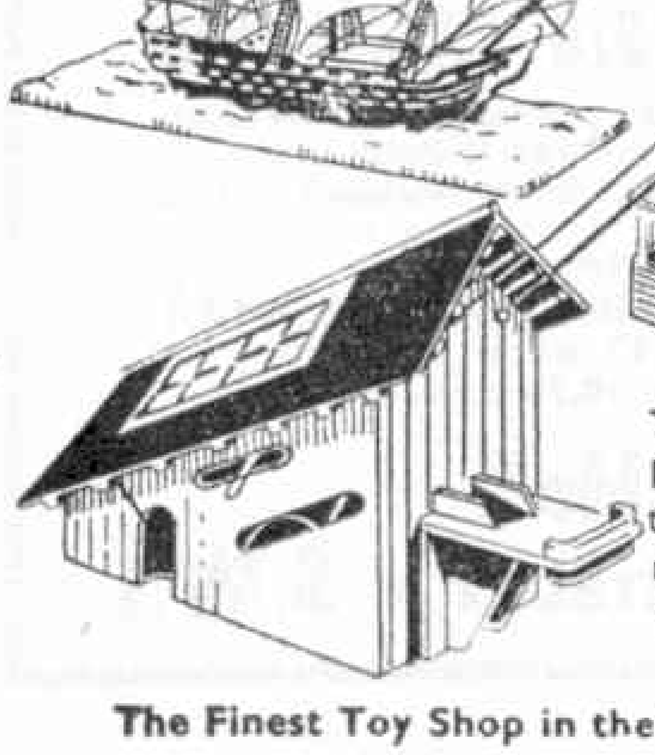

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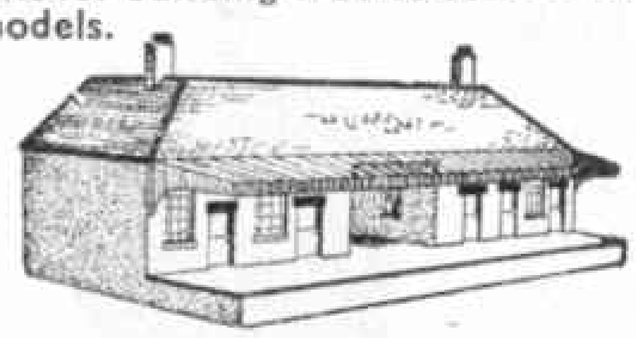

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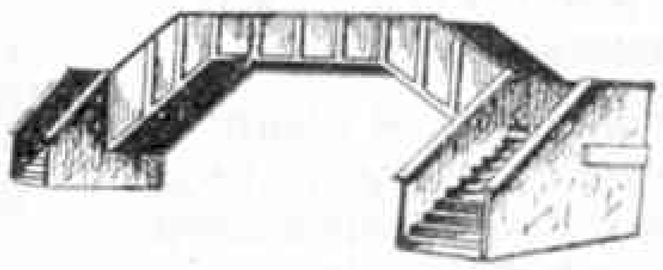

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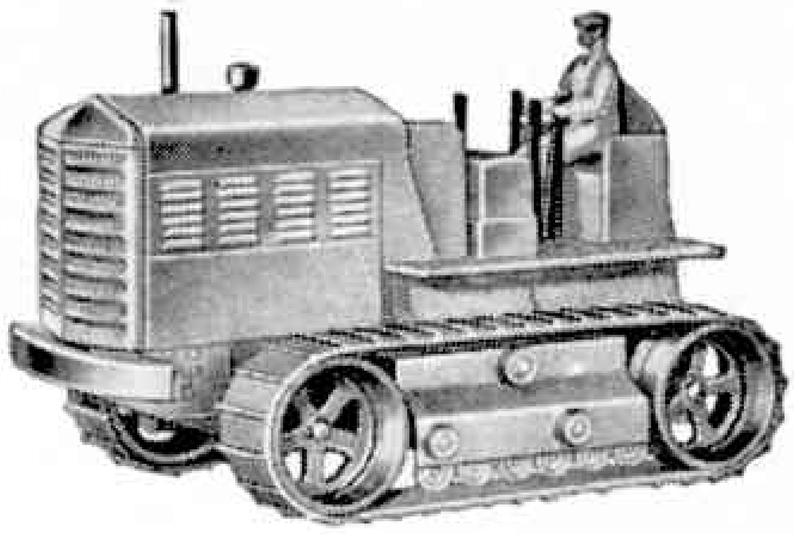

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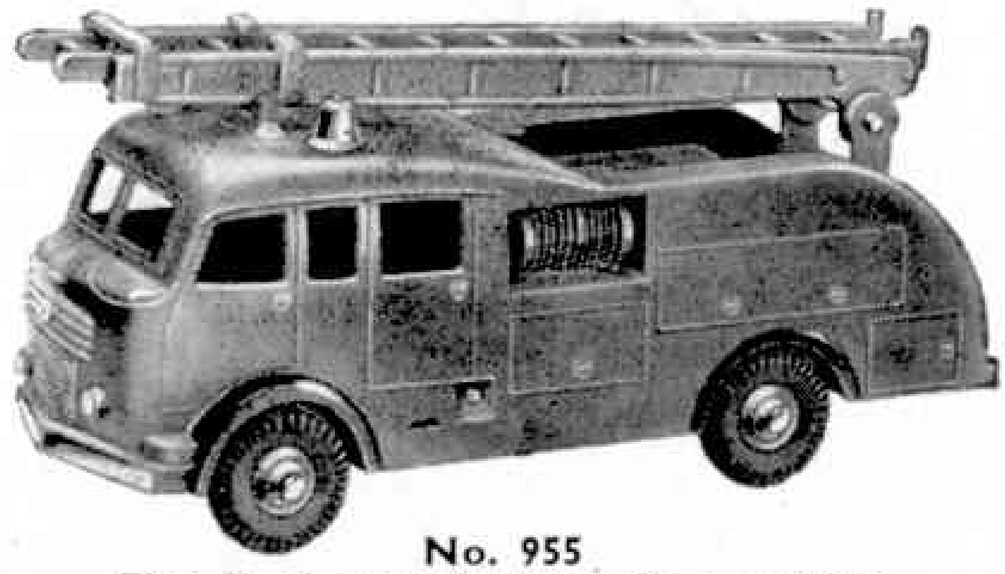

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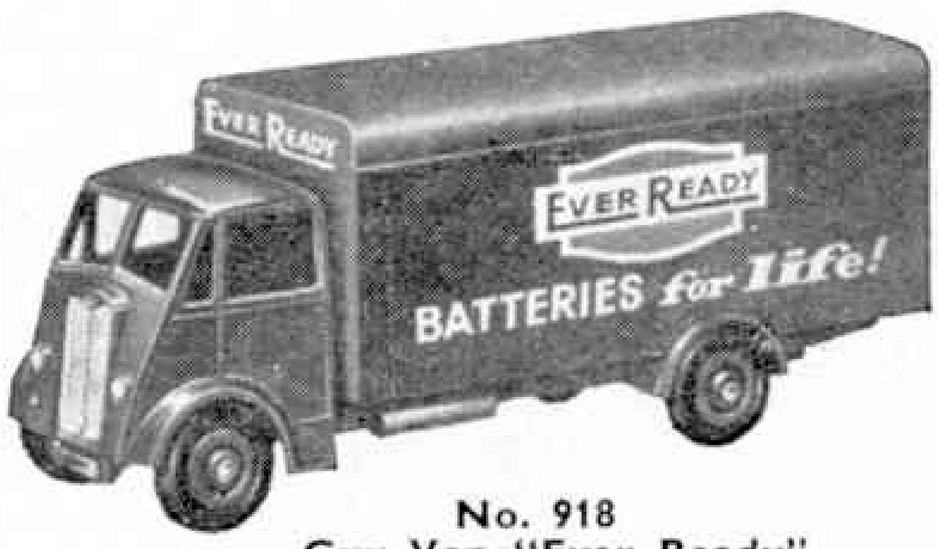

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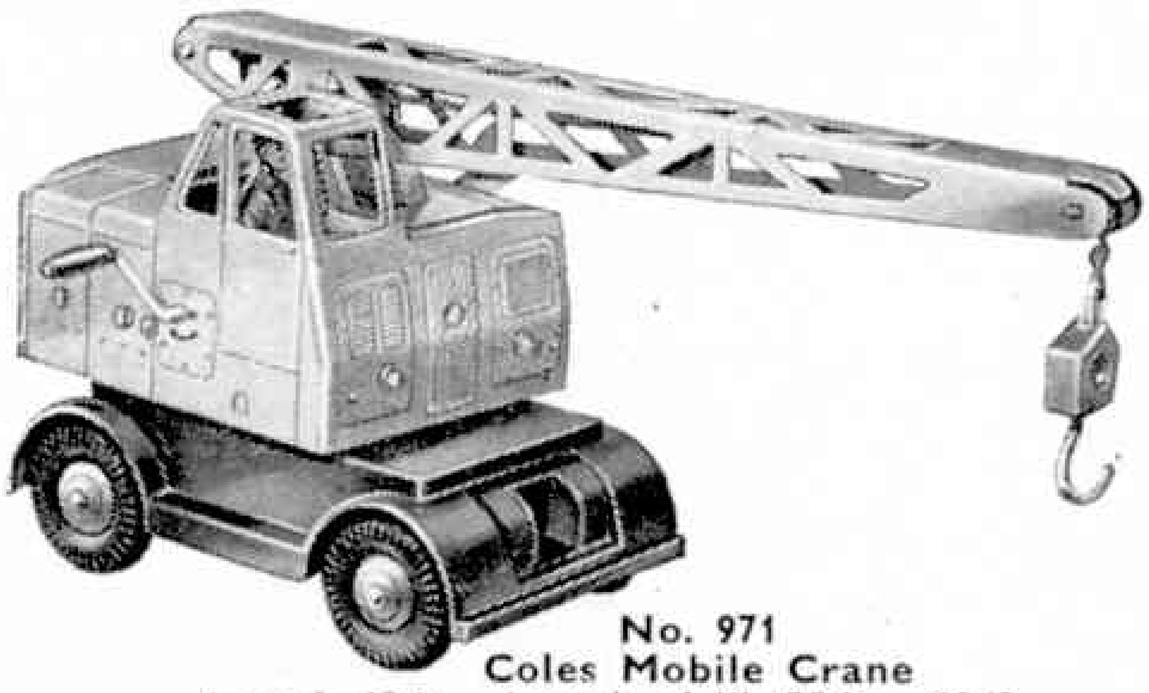

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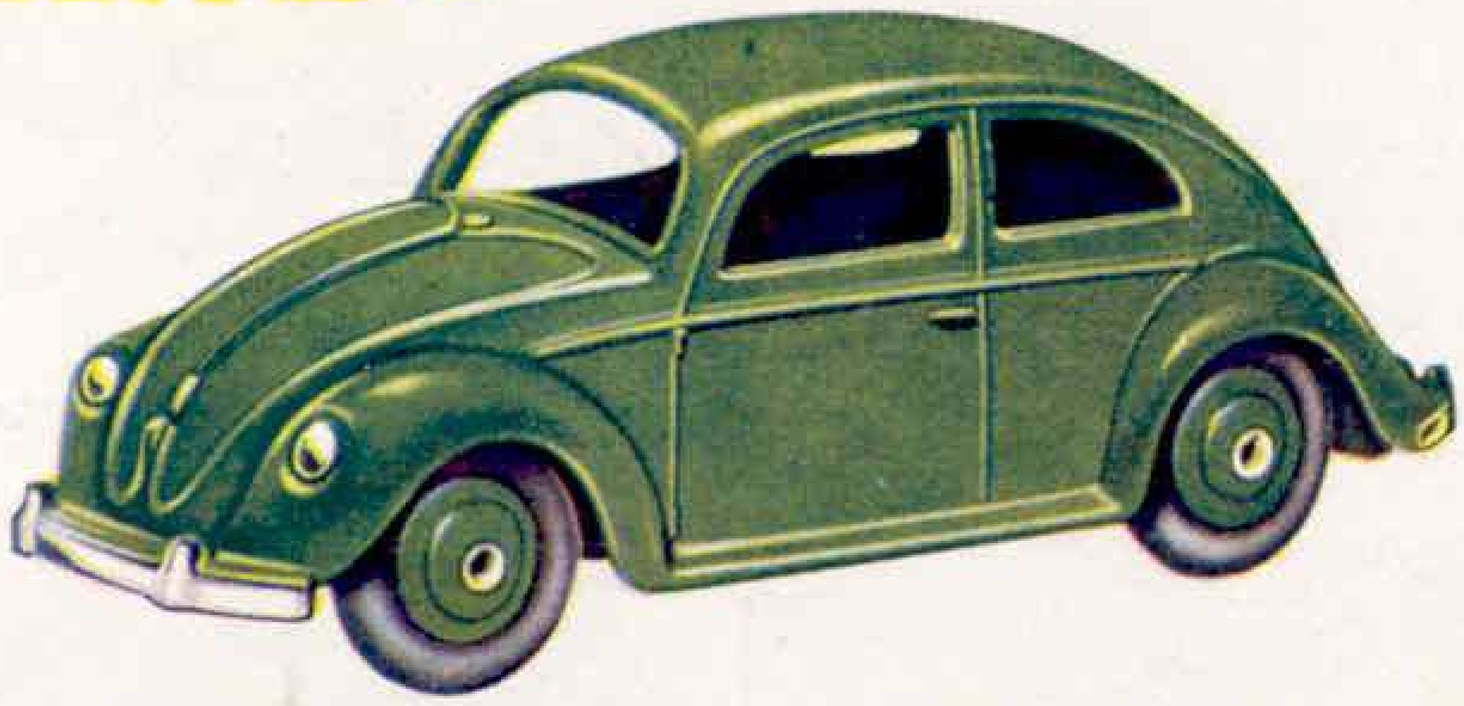

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